APPENDIX B

FIELD DATA

TOLUENE-SOLUBLE ORGANICS

EQM

FIELD DATA SHEET

M315

Plant: AK Middletown | Sample Type: ~~M315~~ | Operator: EZ | Nozzle ID: 0156 | Thermocouple #: T3-4P

Sampling Location: P. Baghouse Stack 2 | Pbar: 30.20 | Ps: -1.1 | Assumed Bws: 2.5 | Filter #: QZ-3097

Run Number: P-315-1 | Date: 9/12/16 | CO_2: CEM | O_2: CEM | Meter Box #: 5 | Y: 0.993 | ΔH@: 1.906

Pretest Leak Rate: 0.021 cfm @ 10 in.Hg. | Probe Length/Type: 3'6L | Pitot#: T3-4P | Post-Test Leak Rate: 0.003 cfm @ 5 in.Hg. } End of Day Shift

Pretest Leak Check: Pitot: √ Orsat: - | Stack Diameter: 35.5" | K: 0.6441 | Post-Test Leak Check: Pitot: √ Orsat: -

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1026	196.500											
1	3:14	1026-29	198.616	2.8	1.7	1.7	92	250	265	62	N/A	64	63	1
2	6:32	1045-48	200.875	2.7	1.6	1.6	104	248	251	61		65	64	1
3	9:42	1102-05	203.034	2.5	1.5	1.5	112	250	260	60		66	66	1
4	12:55	1116-19	205.278	2.8	1.7	1.7	121	257	264	60		68	67	1
5	16:19	1136-39	207.614	2.7	1.6	1.6	118	258	265	61		69	68	1
6	19:38	1151-54	209.998	3.2	1.9	1.9	122	255	261	62		70	69	1
1	22:56	1201-04	212.429	3.3	2.0	2.0	117	261	263	61		72	70	1
2	26:14	1221-24	214.956	3.4	2.0	2.0	115	263	265	62		73	72	1
3	29:29	1238-41	217.462	3.2	1.9	1.9	122	264	266	62		74	73	1
4	32:48	1257-1300	220.010	3.3	2.0	2.0	119	267	265	64		75	75	1
5	36:03	1316-19	222.756	3.7	2.2	2.2	120	268	264	60		76	76	1.5
6	39:26	1336-39	225.374	3.7	2.2	2.2	125	264	265	60		77	77	1.5
1	42:42	1350-54	227.984	3.7	2.2	2.2	127	265	262	60		77	77	1.5
2	46.05	1409-12	230.581	3.4	2.0	2.0	128	263	248	61		77	77	1
3	49:19	1427-30	233.065	3.4	2.0	2.0	124	265	253	62		78	77	1
4	52:41	1507-10	235.644	3.4	2.0	2.0	122	265	264	63		78	78	1
5	55:54	1524-28	238.197	3.6	2.1	2.1	125	257	265	62		78	78	1
6	59:12	1542-45	240.868	3.7	2.2	2.2	121	262	266	63		78	78	1.5
1	62:38	1559-1603	243.702	3.7	2.2	2.2	123	261	267	64		79	78	1.5
2	65:57	1616-19	246.360	3.6	2.1	2.1	123	264	264	63		78	78	1.5
3	69:13	1633-37	248.924	3.5	2.1	2.1	130	266	250	64		78	78	1
4	72:33	1651-55	251.633	3.5	2.1	2.1	131	265	259	62		78	78	1
5	76:20	1708-13	254.660	3.5	2.1	2.1	124	261	266	63		78	78	1
6	79:39	1725-28	257.368	3.4	2.0	2.0	118	262	263	62		78	78	1
1	82:56	1738-41	260.030	3.5	2.1	2.1	120	268	261	63		78	78	1

LEAK ✓ 260.030 - 260.130 .001 @ 6

$\Delta Vm =$ _____ $\overline{\sqrt{\Delta p}} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

ΔVm Day Shift = 63.530

JMP

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M315 | Operator: CJ | Nozzle ID: 0.156 | Thermocouple #: T3-HP
Sampling Location: Baghouse Stack 2 | Pbar: 30.20 | Ps: -1.1 | Assumed Bws: 2.5 | Filter #: Q2 3097
Run Number: P-315-1 | Date: 9/12/16 | CO_2: CEM | O_2: CEM | Meter Box #: 5 | Y: 0.993 | ΔH@: 1.906
Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 3'GL | Pitot#: T3-HP | Post-Test Leak Rate: .002 cfm @ 6 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: — | Stack Diameter: 35.5" | K: 0.6441 | Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	~~0~~	—	260.130											
1	86:13	2222-2226	262.765	3.5	2.2	2.2	83	252	258	66	N/A	71	72	2
2	89:31	2233-2236	265.495	3.4	2.1	2.1	88	256	266	64		71	72	2
3	92:56	2244-2248	268.287	3.4	2.1	2.1	93	256	265	61		71	71	2
4	96:13	2305-2308	271.025	3.4	2.1	2.1	94	266	266	61		71	71	2
5	99:31	2323-2326	273.657	3.3	2.0	2.0	99	266	268	62		71	71	2
6	102:49	2342-2345	276.361	3.4	2.1	2.1	97	257	263	62		70	70	2
~~7~~	106:15	0003-0007	279.088	3.4	2.1	2.1	95	268	267	64		70	70	2

ΔVm = 82.488 $\overline{\sqrt{\Delta p}}$ = 1.8265 $\overline{\Delta H}$ = 2.01 $\overline{Ts}$ = 114 $\overline{Tm}$ = 74 150-99.6

$\overline{\Delta p}$ = 3.34

VMP

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/13/16 Sample Box No. SB-12
Sample Location Pushing Baghouse
Train Preparer EZ
Sample Recovery Person CJ
Comments M315

Run No. P-315-1
Job No. 050074.0172
Filter No. QZ3097
Sample Head No. 4
Barometer No. TNK.COM
Balance No. 2

Front Half
Acetone Container No. P-315-1 FRONT 1/2 ACETONE FRONT 1/2 TOLUENE Liquid Level Marked ✓ Sealed ✓

Filter
Container No. QZ 3097 Sealed ✓

Description of Filter grey loading

Samples Stored and Locked ✓

Back Half/Moisture
Container No. P-315-1 BACK 1/2 H_2O / ACETONE/TOLUENE

Liquid Level Marked _____ Sealed _____

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H_2O	100	756.0	756.0	0.0
2	H_2O	100	766.8	773.0	6.2
3	—	—	665.4	666.9	1.5
4	Silica Gel	250	965.9	984.0	18.1
5					
6					
Total					25.8

Description of Impinger Catch: _____ Bws = 15%

JMP

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M315 | Operator: EZ/CT | Nozzle ID: 0.156 | Thermocouple #: T3-49

Sampling Location: Baghouse Stack 2 | Pbar: 30.15 | Ps: -1.1 | Assumed Bws: 25 | Filter #: QZ3100

Run Number: P-315-2 | Date: 9/13/16 | CO_2: CEM | O_2: CEM | Meter Box #: 5 | Y: 0.993 | ΔH@: 1.906

Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 3' GL | Pitot#: T3-49 | Post-Test Leak Rate: 0.003 cfm @ 3 in.Hg. (End of Day Shift)

Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: 0.6441 | Post-Test Leak Check: Pitot: ✓ | Orsat:

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
Starting Port #11 0	0	1339	279.288											
1	3:13	1339-42	281.570	2.7	1.6	1.6	120	261	266	65	N/A	73	73	1
2	6:34	1429-32	283.908	2.5	1.5	1.5	130	260	265	65		75	75	1
3	9:56	1451-43	286.222	2.6	1.5	1.5	131	261	264	64		76	76	1
4	13:15	1456-1500	288.496	2.6	1.5	1.5	129	266	250	64		77	77	1
5	16:32	1521-24	290.905	3.1	1.8	1.8	128	260	261	60		78	77	1
6	19:51	1532-36	293.390	3.1	1.8	1.8	132	263	264	60		78	78	1
1	23:15	1550-53	295.897	3.0	1.8	1.8	130	265	266	60		79	78	1
2	26:36	1605-08	298.431	3.4	2.0	2.0	128	263	264	61		79	78	1.5
3	29:56	1620-24	300.938	3.2	1.9	1.9	135	264	264	61		79	79	1.5
4	33:10	1641-45	303.412	3.4	2.0	2.0	133	264	265	62		79	79	1.5
5	36:28	1651-54	305.872	3.3	1.9	1.9	136	264	265	62		79	78	1.5
6	39:49	1700-03	308.405	3.2	1.9	1.9	139	255	262	63		79	78	1.5
1	43:05	1709-12	310.977	3.6	2.1	2.1	136	270	265	61		79	78	1.5
2	46:26	1721-24	313.507	3.3	1.9	1.9	138	259	264	60		78	77	1.5
End of Day Shift 3	49:44	1730-33	316.055	3.3	1.9	1.9	129	269	266	59		78	77	1.5
4	53:06	2232-2236	319.121	3.6	2.2	2.2	95	262	266	53		71	70	2
5	56:28	2244-2248	321.954	3.6	2.2	2.2	99	254	264	56		73	72	2
6	59:43	2303-2306	324.644	3.5	2.1	2.1	105	260	266	56		74	73	2
1	62:58	2312-2326	327.240	3.4	2.1	2.1	109	260	264	54		75	75	2
2	66:15	2341-2345	329.916	3.5	2.1	2.1	114	252	264	50		76	76	2
3	69:37	0000-0004	332.601	3.4	2.0	2.0	116	256	265	52		77	76	2
4	72:57	0019-0022	335.344	3.5	2.1	2.1	110	261	262	54		77	77	2
5	76:18	0040-0044	337.929	3.5	2.1	2.1	114	260	267	55		77	77	2
6	79:40	0057-0100	340.615	3.5	2.1	2.1	112	266	266	54		77	77	2
1	83:01	0110-0119	343.315	3.4	2.1	2.1	111	266	264	55		78	77	2

LEAK CHECK 316.055-316.130

$\Delta Vm =$ _____ $\overline{\sqrt{\Delta p}} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

ΔVm Day Shift = 36.767

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M315 | Operator: EZ/CJ | Nozzle ID: 0.156 | Thermocouple #: T3-4P
Sampling Location: Bighouse Stack2 | Pbar: 30.15 | Ps: -1.1 | Assumed Bws: 2.5 | Filter #: Q2 3100
Run Number: P-315-2 | Date: | CO_2: CEM | O_2: CEM | Meter Box #: 5 | Y: 0.993 | ΔH@: 1.996
Pretest Leak Rate: ___ cfm @ ___ in.Hg. | Probe Length/Type: 3' GL | Pitot#: T3-4P | Post-Test Leak Rate: .003 cfm @ 8 in.Hg.
Pretest Leak Check: Pitot: ___ Orsat: ___ | Stack Diameter: 35.5" K: 0.6441 | Post-Test Leak Check: Pitot: ✓ Orsat: NA

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0														
2	86:45	0135-0139	346.064	3.4	2.1	2.1	109	256	263	60	N/A	77	77	2
3	89:45	0145-0148	348.666	3.3	2.0	2.0	112	269	266	57		78	77	2
4	93:06	0247-0250	351.345	3.4	2.1	2.1	104	256	264	56		76	76	2
5	96:29	0257-0301	354.117	3.4	2.1	2.1	106	265	264	62		76	76	2
6	99:45	0308-0311	356.820	3.6	2.2	2.2	106	257	266	60		76	76	2
1	103:15	0324-0327	359.709	3.4	2.1	2.1	111	262	263	61		76	76	2

ΔVm = 80.346 $\overline{\sqrt{\Delta p}}$ = 1.8092 $\overline{\Delta H}$ = 1.96 $\overline{Ts}$ = 120 $\overline{Tm}$ = 77

$\overline{\Delta p}$ = 3.28

150 = 100.9%

JMP

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown
Run No. P-315-2
Date 9/14/16 Sample Box No. _____
Job No. 050074.0172
Sample Location Pushing Bag house
Filter No. QZ-3100
Train Preparer CJ
Sample Head No. 4
Sample Recovery Person CJ
Barometer No. TWC.COM
Comments M315
Balance No. 2

Front Half
Acetone P-315-2 FRONT 1/2 ACETONE FRONT 1/2 TOLUENE Liquid
Container No. _____ Level Marked ✓ Sealed ✓

Filter
Container No. QZ-3100 Sealed ✓

Description of Filter light grey loading

Samples Stored and Locked ✓

Back Half/Moisture
Container No. P-315-2 BACK 1/2 H_2O / ACETONE/HEXANE RINSE

Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H_2O	100	755.3	759.1	3.8
2	H_2O	100	762.6	768.0	5.4
3	—	—	665.3	666.6	1.3
4	SG	250	984.0	1004.4	20.4
5					
6					
Total					30.9

JM

Description of Impinger Catch: clear

$B_{WS} = 1.81$

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: 315 | Operator: EJ/CJ
Sampling Location: Baghouse Stack 2 | Pbar: 30.21 | Ps: -1.1
Run Number: P-315-3 | Date: 9/14/16 | CO_2: CEM | O_2: CEM
Pretest Leak Rate: 0.001 cfm @ 15 in.Hg. | Probe Length/Type: 3' 6L | Pitot#: T3-4P
Pretest Leak Check: Pitot: √ | Orsat: — | Stack Diameter: 35.5" | K: 0.84841

Nozzle ID: .156 | Thermocouple #: T3-4P
Assumed Bws: 25 | Filter #: 92302
Meter Box #: 5 | Y: 0.993 | ΔH@: 1.926
Post-Test Leak Rate: 0.001 cfm @ 5 in.Hg. } End of Day Shift
Post-Test Leak Check: Pitot: √ | Orsat: —

LEAK CHECK 0.001 @ 5" 371.650 - 371.750

End of Day Shift

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	1635	360.982											
1	3:17	1635-38	362285	2.8	1.7	1.7	122	252	264	65	N/A	80	80	2
2	6:40	1648-52	364.697	2.7	1.6	1.6	125	254	264	65		81	80	2
3	9:56	1705-08	367.009	2.9	1.7	1.7	128	257	263	60		81	81	2
4	13:13	1722-26	369.341	2.8	1.7	1.7	127	255	264	61		81	81	2
5	16:28	1735-38	371.650	2.7	1.6	1.6	129	257	266	62		81	81	2
6	20:00	2221-2224	374.665	3.6	2.2	2.2	94	264	266	58		72	73	2
1	23:27	2231-2234	377.368	3.5	2.1	2.1	107	260	265	54		72	72	2
2	26:40	2244-2248	380.000	3.5	2.1	2.1	108	259	265	56		73	73	2
3	29:52	2303-2307	382.609	3.2	1.9	1.9	113	251	268	59		73	73	2
4	33:08	2322-2326	385.247	3.4	2.0	2.0	111	253	264	60		73	73	2
5	36:22	2342-2346	387.869	3.4	2.0	2.0	110	255	266	58		72	73	2
6	39:39	0000-0004	390.500	3.4	2.1	2.1	107	266	262	58		73	73	2
1	42:57	0019-0023	393.145	3.5	2.1	2.1	111	261	262	59		73	73	2
2	46:13	0037-0042	395.775	3.4	2.0	2.0	111	260	268	61		73	73	2
3	49:26	0057-0100	398.386	3.3	2.0	2.0	114	259	268	58		73	73	2
4	52:41	0116-0120	400.801	3.4	2.1	2.1	104	256	263	60		72	73	2
5	55:54	0135-0138	403.629	3.4	2.1	2.1	107	252	264	60		72	72	2
6	59:06	0144-0148	406.166	3.4	2.1	2.1	105	258	265	61		72	72	2
1	62:21	0318-0322	408.767	3.5	2.2	2.2	96	257	264	61		71	71	2
2	65:37	0335-0338	411.433	3.4	2.1	2.1	97	260	265	59		71	71	2
3	68:54	0343-0347	414.111	3.6	2.2	2.2	99	258	266	59		71	71	2
4	72:06	0352-0356	416.662	3.4	2.1	2.1	98	257	264	60		72	71	2
5	75:16	0401-0404	419.239	3.3	2.0	2.0	100	259	262	59		72	71	2
6	78:31	0410-0413	421.873	3.4	2.1	2.1	97	256	262	59		72	71	2

$\Delta Vm =$ _____ $\overline{\sqrt{\Delta p}} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M315 | Operator: EZ/CJ
Sampling Location: Baghouse Stack 2 | Pbar: 30.21 | Ps: -1.1
Run Number: P-315-3 | Date: 9/14-15/16 | CO_2: CEM | O_2: CEM
Pretest Leak Rate: 0.001 cfm @ 15 in.Hg. | Probe Length/Type: 3'6" | Pitot#: T3-4P
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: 0.6441

Nozzle ID: 0.156 | Thermocouple #: T3-4P
Assumed Bws: 2.5 | Filter #: QZ-3102
Meter Box #: 5 | Y: 0.993 | ΔH@: 1.906
Post-Test Leak Rate: 0.001 cfm @ 9 in.Hg.
Post-Test Leak Check: Pitot: ✓ | Orsat: —

Leak check 0.001 @ 6" New volume 437.163

-0.093

leak check 0.001 @ 7 437.222

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	—	—	—											
1	81:44	0419-0422	424.515	3.3	2.0	2.0	97	266	266	60	N/A	72	71	2
2	84:57	0433-0436	427.115	3.4	2.1	2.1	94	251	266	59		72	71	2
3	88:09	0451-0454	429.650	3.5	2.1	2.1	98	256	264	58		71	71	2
4	91:21	0508-0511	432.161	3.3	2.0	2.0	102	254	265	62		71	71	2
5	94:27	0525-0528	434.591	3.3	2.0	2.0	97	262	267	62		71	71	2
6	97:39	0535-0538	437.070	3.2	2.0	2.0	95	257	267	60		71	70	2
1	100:52	1034-37	439.752	3.6	2.2	2.2	92	262	265	58		67	67	2.5
2	104:19	1046-49	442.468	3.6	2.2	2.2	102	259	265	57		68	68	2.5
3														

ΔVm = 81.234 $\sqrt{\Delta p}$ = 1.8195 $\overline{\Delta H}$ = 2.01 $\overline{Ts}$ = 106 $\overline{Tm}$ = 73

$\overline{\Delta p}$ = ~~3.156~~ 3.3156

✓ DF

EQ Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/14/16 Sample Box No. SB-8
Sample Location Pushing Baghouse
Train Preparer EZ
Sample Recovery Person BF
Comments 315

Run No. P-315-3
Job No. 052074.0172
Filter No. QZ-3102
Sample Head No. SH-7
Barometer No. TWC.com
Balance No. FB-2

Front Half
Acetone
Container No. P-315-3 Liquid Level Marked ✓ Sealed ✓

Filter
Container No. QZ-3102 Sealed ✓

Description of Filter no visible loading

Samples Stored and Locked ✓

Back Half/Moisture
Container No. NA

Liquid Level Marked NA Sealed NA

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H_2O	100	774.6	767.0	-7.6
2	H_2O	100	781.3	786.7	5.4
3	—	—	669.9	663.1	-2.2
4	Silica Gel	250	942.0	970.9	28.9
5					
6					
Total					28.9

JMP

Description of Impinger Catch: clear

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: 315 MCEM | Operator: RK

Sampling Location: Combustion Stack | Pbar: 30.20 | Ps: -0.80

Run Number: C-315-1 | Date: 9-12-16 | CO_2: 3 | O_2: 15

Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 6' GL | Pitot#: P5-B

Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 168" | K: 57.363

175.973

Nozzle ID: .500 | Thermocouple #: T5-B

Assumed Bws: 10 | Filter #: QZ 3098

Meter Box #: 3 | Y: 1.009 | ΔH@: 1.890

Post-Test Leak Rate: — cfm @ — in.Hg.

Post-Test Leak Check: Pitot: — | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1005	~~176.973~~											
1	5	1010	179.2	0.040	1.50	1.50	351	260	260	65	~~65~~ 73	64	63	1
2	10	1015	182.3	0.035	1.3	1.3	361	240	250	57	68	64	63	1
3	15	1020	185.6	0.040	1.5	1.5	365	246	253	53	65	67	64	1
4	20	1025	188.7	0.035	1.3	1.3	370	252	252	53	63	70	65	1
5	25	1030	191.9	0.040	1.5	1.5	370	251	251	53	62	70	65	1
6	30	1035	195.1	0.040	1.5	1.5	374	252	252	55		72	66	1
7	35	1040	198.4	0.040	1.5	1.5	376	249	250	57		74	67	1
8	40	1045	201.6	0.040	1.5	1.5	380	251	251	59		76	68	1
9	45	1050	204.8	0.040	1.5	1.5	355	249	251	60		78	69	1
10	50	1055	207.6	0.040	1.5	1.5	352	251	249	63		78	70	1
11	55	1100	211.4	0.035	1.3	1.3	355	248	250	64		81	72	1
12	60	1105	214.6	0.035	1.3	1.3	358	249	250	61		81	73	1
1	65	1110	218.4	0.040	1.5	1.5	364	247	244	62		83	75	1
2	70	1115	220.9	0.040	1.5	1.5	366	248	245	62		83	75	1
3	75	1120	224.1	0.040	1.5	1.5	370	250	249	61		84	76	1
4	80	1125	231.1	0.040	1.5	1.5	374	249	251	61		84	77	1
5	85	1130	233.9	0.040	1.5	1.5	379	250	250	62		85	77	1
6	90	1135	235.6	0.040	1.5	1.5	381	249	250	62		85	78	1
7	95	1140	237.4	0.035	1.3	1.3	349	251	249	62		86	78	1
8	100	1145	240.5	0.035	1.3	1.3	350	250	245	62		86	79	1
9	105	1150	243.7	0.035	1.3	1.3	351	248	245	63		87	79	1
10	110	1155	246.7	0.035	1.3	1.3	354	246	248	64		87	80	1
11	115	1200	249.8	0.040	1.5	1.5	358	251	250	62		87	81	1
12	120	1205	252.9	0.040	1.5	1.5	360	250	250	61		88	81	1

ΔVm = — $\overline{\sqrt{\Delta p}}$ = — $\overline{\Delta H}$ = — $\overline{Ts}$ = — $\overline{Tm}$ = —

EQM

FIELD DATA SHEET page 2

Plant: AK Steel Middletown Sample Type: 315 Operator: RL/DS
Sampling Location: Columbia Stack Pbar: 30.20 Ps: -0.80
Run Number: C-315-1 Date: 9/12/16 CO_2: 3 O_2: 15
Pretest Leak Rate: — cfm @ — in.Hg. Probe Length/Type: 5'6" SS Pitot#: PS-8
Pretest Leak Check: Pitot: — Orsat: — Stack Diameter: 168" K: 57.363

Nozzle ID: 0.500 Thermocouple #: TS-8
Assumed Bws: 10 Filter #: OZ 3098
Meter Box #: 3 Y: 1.009 ΔH@: 1.820
Post-Test Leak Rate: 0.002 cfm @ 5 in.Hg.
Post-Test Leak Check: Pitot: √± Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	1250	1205	252.9											
1	1255	1210	256.3	0.040	1.5	1.5	351	246	250	60	60	88	81	1
2	1300	1215	259.789	0.040	1.5	1.5	344	247	248	60	60	88	81	1

ΔVm = 83.816 $\sqrt{\Delta p}$ = 0.1960 $\overline{\Delta H}$ = 1.44 $\overline{Ts}$ = 362 $\overline{Tm}$ = 77

0.0385

√BF

EQ Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/12/16 Sample Box No. SB-4
Sample Location COMBUSTION
Train Preparer EZ
Sample Recovery Person BF
Comments 315

Run No. Comb 315-1
Job No. 050074.0172
Filter No. 3098
Sample Head No. SH-1
Barometer No. PVC.com
Balance No. FB-2

Front Half
Acetone Container No. C-315-1 ✓ Liquid Level Marked ✓ Sealed ✓

Filter
Container No. QZ-3098 Sealed ✓

Description of Filter black

Samples Stored and Locked ✓

Back Half/Moisture
Container No. NA

Liquid Level Marked NA Sealed NA

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H2O	100	761.4	862.4	101.0
2	H2O	100	752.7	794.5	41.8
3	—	—	675.0	686.7	11.7
4	Silica Gel	250	952.0	973.0	21.0
5					
6					
Total					176.3

Description of Impinger Catch: clear

✓BF

EQM

FIELD DATA SHEET

Plant: AK Steel Middletown | Sample Type: 315 | Operator: MH/DS
Sampling Location: Combustion Stack | Pbar: 30.15 | Ps: -0.20 "
Run Number: C-315-2 | Date: 9/13/16 | CO_2: 3 | O_2: 15
Pretest Leak Rate: 0.002 cfm @ 11 in.Hg. | Probe Length/Type: 5'6" | Pitot#: PS-2
Pretest Leak Check: Pitot: √ | Orsat: — | Stack Diameter: 168" | K: 60.573

Nozzle ID: 0.500 | Thermocouple #: TS-2
Assumed Bws: 10 | Filter #: QZ 3099
Meter Box #: 3 | Y: 1.009 | ΔH@: 1.89
Post-Test Leak Rate: 0.002 cfm @ 5 in.Hg.
Post-Test Leak Check: Pitot: √ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
	0	0955	260.021											
	5	1000	263.500	0.94	1.60	1.60	348	249	252	68		65	64	1
	10	1005	266.7	0.04	1.60	1.60	360	250	253	62		67	65	1
	15	1010	270.3	0.05	1.9	1.9	361	248	252	60		68	66	1
	20	1015	274.2	0.05	1.9	1.8	364	250	250	62		73	67	1
	25	1020	277.6	0.05	1.9	1.9	365	249	250	63		75	67	1
	30	1025	281.3	0.05	1.9	1.9	374	249	249	65		76	68	1
	35	1030	284.8	0.04	1.6	1.6	375	251	249	65		78	69	1
	40	1035	288.0	0.04	1.6	1.6	376	251	250	66		79	70	1
	45	1040	291.2	0.04	1.6	1.6	378	249	250	66		80	70	1
	50	1045	294.8	0.04	1.6	1.6	380	253	250	57		82	72	1
	55	1050	297.8	0.04	1.6	1.6	350	249	251	58		82	73	1
	60	1055	301.2	0.04	1.6	1.6	353	246	250	57		83	74	1
	65	1100	304.6	0.04	1.6	1.6	357	251	250	57		83	76	1
	70	1105	307.7	0.035	1.4	1.4	360	251	242	57		86	76	1
	75	1110	311.2	0.035	1.4	1.4	361	252	241	59		86	77	1
	80	1115	314.2	0.04	1.6	1.6	365	253	250	60		87	78	1
	85	1120	317.6	0.04	1.6	1.6	369	248	249	61		88	79	1
	90	1125	320.9	0.04	1.6	1.6	373	247	249	61		89	80	1
	95	1130	324.3	0.04	1.6	1.6	374	249	250	62		90	80	1
	100	1135	327.8	0.04	1.6	1.6	380	249	250	62		90	81	1
	105	1140	331.0	0.035	1.4	1.4	383	251	249	62		90	82	1
	110	1145	334.4	0.035	1.4	1.4	351	249	250	58		89	82	1
	115	1150	338.1	0.040	1.6	1.6	351	248	249	57		90	82	1
	120	1155	341.622	0.050	1.9	1.9	353	249	249	56		90	83	1

$\Delta Vm = 81.601 \sqrt{\Delta p} = 0.2028 / 0.0413$ $\overline{\Delta H} = 1.63$ $\overline{Ts} = 365$ $\overline{Tm} = 78$

√ OF

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/13/14 Sample Box No. SB# 2
Sample Location Combustion Stack
Train Preparer BF
Sample Recovery Person BF/RK
Comments 315

Run No. Comb 315-2
Job No. 080074.0172
Filter No. QZ-3099
Sample Head No. SH-1
Barometer No. TWC.com
Balance No. FB-2

Front Half
Acetone Liquid
Container No. C-315-2 Level Marked ✓ Sealed ✓

Filter
Container No. QZ-3099 Sealed ✓

Description of Filter black

Samples Stored and Locked ✓

Back Half/Moisture
Container No. N14

Liquid Level Marked N14 Sealed N14

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H_2O	100	777.4	899.3	121.9
2	H_2O	100	757.8	789.6	31.8
3	—	—	668.6	672.3	3.7
4	Silica Gel	250	951.9	981.0	29.1
5					
6					
Total					186.5

Description of Impinger Catch: clear

✓BF

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: 315 | Operator: DC/DS
Sampling Location: Combustion Stack | Pbar: 30.21 | Ps: -0.75 "
Run Number: C-315-3 | Date: 9/14/16 | CO_2: 3 | O_2: 15
Pretest Leak Rate: 0.001 cfm @ 11 in.Hg. | Probe Length/Type: 5'/6ft | Pitot#: PS-2
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 168 | K: 60.573

Nozzle ID: 0.500 | Thermocouple #: PS-2
Assumed Bws: 9 | Filter #: QZ 3101
Meter Box #: 3 | Y: 1.009 | ΔH@: 1.89
Post-Test Leak Rate: 0.000 cfm @ 6 in.Hg.
Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0 0		0955	342.767											
1 5		1000	346.3	0.04	1.7	1.7	300	260	244	68		66	65	1
2 10		1005	350.4	0.04	1.7	1.7	355	268	255	67		67	65	1
3 15		1010	353.1	0.04	1.7	1.7	352	260	254	62		72	66	1
4 20		1015	356.8	0.04	1.7	1.7	357	250	242	63		73	67	1
5 25		1020	359.7	0.035	1.4	1.4	363	245	248	63		75	68	1
6 30		1025	362.870	0.035	1.4	1.4	368	240	250	64		77	69	1
7 35		1030	366.0	0.035	1.4	1.4	370	271	253	65		78	70	1
8 40		1035	370.2	0.040	1.7	1.7	373	270	243	56		78	70	1
9 45		1040	373.0	0.040	1.7	1.7	377	240	248	51		80	72	1
10 50		1045	376.5	0.04	1.7	1.7	347	247	244	50		81	72	1
11 55		1050	380.1	0.04	1.7	1.7	348	250	248	50		82	73	1
12 60		1055	383.6	0.04	1.7	1.7	351	251	249	51		84	74	1
1 65		1100	387.1	0.04	1.7	1.7	356	251	251	52		87	76	1
2 70		1105	390.8	0.05	2.0	2.0	357	248	249	53		87	76	1
3 75		1110	394.4	0.05	2.0	2.0	353	251	248	55		87	77	1
4 80		1115	398.4	0.04	1.7	1.7	358	250	249	54		87	78	1
5 85		1120	402.0	0.04	1.7	1.7	370	249	247	56		89	79	1
6 90		1125	405.6	0.04	1.7	1.7	373	252	248	57		89	80	1
7 95		1130	409.1	0.04	1.7	1.7	374	249	246	57		90	80	1
8 100		1135	412.6	0.035	1.4	1.4	380	253	250	58		90	82	2
9 105		1140	415.9	0.035	1.4	1.4	349	251	247	58		90	82	2
10 110		1145	419.3	0.040	1.7	1.7	348	251	254	59		90	82	2
11 115		1150	423.1	0.040	1.7	1.7	350	251	249	58		91	83	2
12 120		1155	426.554	0.040	1.7	1.7	352	250	250	58		91	83	2

$\Delta Vm = 83.787 \sqrt{\Delta p} = 0.1993$ $\Delta H = 1.66$ $\overline{Ts} = 358$ $\overline{Tm} = 79$

0.0398

✓BF

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/14/1
Sample Box No. SB-4
Sample Location Combustion
Train Preparer BF
Sample Recovery Person BF/RK
Comments 315

Run No. C-315-3
Job No. 052074.0172
Filter No. QZ-3101
Sample Head No. SH-1
Barometer No. ~~FB-2~~ FALCON
Balance No. FB-2

Front Half
Acetone Liquid
Container No. C-315-3 Level Marked ✓ Sealed ✓

Filter
Container No. ~~C~~ QZ-3101 Sealed ✓

Description of Filter black

Samples Stored and Locked ✓

Back Half/Moisture
Container No. NA

Liquid Level Marked NA Sealed NA

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H_2O	100	775.0	919.7	144.7
2	H_2O	100	759.5	793.2	33.7
3	—	—	669.1	671.6	2.5
4	Silica Gel	250	909.9	938.3	28.4
5					
6					
Total					209.3

Description of Impinger Catch: Clear

JBF

FILTERABLE PM AND HAP METALS

EQM

FIELD DATA SHEET

pg 1 of 3

Plant: AK Middletown | Sample Type: MZ9 | Operator: GD
Sampling Location: Baghouse #3 | Pbar: 30.11 | Ps: -2.0
Run Number: P-29-1 | Date: 8-29-16 | CO_2: CEM | O_2: CEM
Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 3'G | Pitot#: T3-4
Pretest Leak Check: Pitot: ✓ Orsat: — | Stack Diameter: 35.5" K: 0.6106

Nozzle ID: 0.156 | Thermocouple #: T3-4
Assumed Bws: 1.7 | Filter #: QE2960
Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783
Post-Test Leak Rate: .001 cfm @ 5 in.Hg. } End of Day 1
Post-Test Leak Check: Pitot: ✓ Orsat: — }

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1024	004.071											
1	3:20	1027	006.660	3.3	1.9	1.9	100	251	260	63	238	67	66	3.0
2	6:38	1036-1039	009.238	3.3	1.9	1.9	112	250	258	60	240	69	67	3.0
3	9:47	1049-1052	011.587	2.8	1.6	1.6	123	259	259	59	241	70	69	2.0
4	13:01	1103-1106	013.921	2.9	1.6	1.6	120	258	259	57	241	71	70	2.0
5	16:20	1121-1124	016.466	3.2	1.8	1.8	124	257	260	59	240	72	71	2.0
6	19:36	1140-1143	018.930	3.2	1.8	1.8	121	259	260	60	243	74	73	2.0
1	22:53	1159-1202	021.413	3.1	1.7	1.7	122	259	260	57	245	74	74	2.0
2	26:17	1217-1221	023.945	3.0	1.7	1.7	125	258	259	58	244	76	75	2.0
3	29:35	1241-1245	026.473	3.2	1.8	1.8	121	257	260	57	248	77	77	2.0
4	33:00	1255-1259	029.014	3.2	1.8	1.8	120	260	258	58	247	78	78	2.0
5	36.18	1311-1314	031.405	2,8	1.6	1.6	125	250	260	59	244	80	79	2.0
6	39:33	1322-1325	033.790	2.8	1.6	1.6	122	254	259	58	249	80	79	2.0
1	42:49	1345-1349	036.179	2.8	1.6	1.6	126	252	257	57	248	81	80	2.0
2	46:12	1440-1444	038.745	3.1	1.8	1.8	116	254	258	58	239	82	82	2.0
3	49:31	1453-1456	041.285	3.1	1.8	1.8	122	253	259	59	237	82	82	2.0
4	52:55	1506-1510	043.887	3.1	1.8	1.8	123	257	260	60	240	82	82	2.0
5	56:18	1521-1525	046.428	3.3	1.9	1.9	121	256	259	59	241	82	82	2.0
6	59:43	1540-1543	049.064	3.3	1.9	1.9	120	258	259	60	238	82	82	2.0
1	62:54	1557-1600	051.519	3.4	1.9	1.9	124	252	258	57	239	82	82	2.0
2	66:28	1614-1618	054.208	3.2	1.8	1.8	123	253	260	56	237	82	82	2.0
3	69:56	1631-1635	056.837	3.2	1.8	1.8	122	260	260	57	240	82	82	2.0
4	73:20	1650-1653	059.457	3.3	1.9	1.9	121	250	258	59	238	82	82	2.0
5	76:43	1706-1709	062.036	3.1	1.8	1.8	124	257	259	60	237	82	81	2.0
6	80:01	1723-1726	064.565	3.2	1.8	1.8	123	255	260	59	240	82	81	2.0
1	83:31	1737-1740	067.390	3.2	1.8	1.8	120	253	261	57	238	82	81	2.0

Port change

$\Delta Vm =$ 63.319 (1st DAY Volume) $\sqrt{\Delta p} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

EQM

FIELD DATA SHEET

pg. 2 of 3

Plant: AK Middletown | Sample Type: MM29 | Operator: GD

Sampling Location: Baghouse #3 | Pbar: 30.23 | Ps: -2.0

Run Number: P-29-1 | Date: 8-30-16 | CO_2: CEM | O_2: CEM

Pretest Leak Rate: .001 cfm @ 11 in.Hg. | Probe Length/Type: 3'GI | Pitot#: T3-4

Pretest Leak Check: Pitot: ✓ Orsat: — | Stack Diameter: 35.5" | K: 0.6106

Nozzle ID: 0.156 | Thermocouple #: T3-4

Assumed Bws: 1.7 | Filter #: QZ 2960

Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783

Post-Test Leak Rate: ____ cfm @ ____ in.Hg. Final

Post-Test Leak Check: Pitot: ✓ Orsat: —

Leak check .002

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	83:31	1026-	067.410											
2	86:47	1029	069.876	3.0	1.7	1.7	105	258	259	63	240	67	67	2.0
3	90:06	1043-1046	072.383	3.0	1.7	1.7	105	255	259	57	239	70	69	2.0
4	93:29	1119-1122	074.933	3.0	1.7	1.7	110	257	259	58	241	72	71	2.0
5	96:50	1139-1142	077.464	2.9	1.7	1.7	108	254	259	59	238	73	72	2.0
6	100:14	1201-1204	080.040	3.2	1.8	1.8	112	260	258	58	240	75	74	2.0
1	103:36	1211-1214	082.605	3.2	1.8	1.8	116	261	261	57	241	76	75	2.0
2	106:57	1221-1224	085.105	3.1	1.8	1.8	119	259	258	59	238	76	75	2.0
3	110:14	1231-1234	087.548	3.1	1.7	1.7	122	263	261	60	240	77	76	2.0
4	113:35	1245-1248	090.100	3.1	1.7	1.7	123	260	258	58	238	78	77	1.5
5	117:01	1258-1302	092.727	3.1	1.8	1.8	121	254	259	54	239	78	78	1.5
6	120:23	1316-1319	095.263	3.2	1.8	1.8	122	256	257	54	238	79	78	1.5
1	123:52	1335-1338	097.834	3.1	1.7	1.7	125	258	258	56	237	80	80	1.5
2	125:09	1345-1346	098.342	2.9	1.6	1.6	126	256	257	57	238	81	80	1.5
2	128:40	1348-1351	101.407	2.9	1.6	1.6	126	255	259	59	238	81	80	1.5
X 3	131:53	1442-1445	103.835	3.2	1.8	1.8	122	256	258	61	239	82	82	1.5
X 4	135:19	1458-1501	106.481	3.2	1.8	1.8	121	261	259	60	240	82	82	1.5
X 5	138:24	1508-1511	108.798	3.3	1.9	1.9	122	260	259	58	238	83	83	1.5
X 6	141:42	1525-1528	111.272	3.0	1.7	1.7	125	251	260	59	239	83	83	1.5
X 1	144:59	1542-1545	113.760	3.0	1.7	1.7	124	250	258	59	240	83	83	1.5
X 2	148:23	1559-1602	116.288	3.1	1.8	1.8	122	252	259	58	238	83	83	1.5
X 3	151:48	1616-1619	118.871	3.0	1.7	1.7	122	257	259	60	241	83	83	1.5
X 4	155:08	1633-1636	121.350	3.0	1.7	1.7	123	258	259	58	239	83	83	1.5
X 5	158:32	1651-1654	123.865	2.9	1.7	1.7	122	257	260	57	240	83	83	1.5
X 6	161:57	1708-1711	126.402	3.1	1.8	1.8	119	256	259	58	242	82	83	1.5
1	165:24	1725-1728	129.020	3.1	1.8	1.8	122	255	259	56	239	82	82	1.5

ONE Push

Port Change

$\Delta Vm =$ _____ $\overline{\sqrt{\Delta p}} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M29 | Operator: GD

Sampling Location: Baghouse #3 | Pbar: 30.23 | Ps: -2.0

Run Number: P-29-1 | Date: 8-30-16 | CO_2: CEM | O_2: CEM

Pretest Leak Rate: .001 cfm @ 11 in.Hg. | Probe Length/Type: 3' GI | Pitot#: T3-4

Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: 0.6106

Nozzle ID: 0.156 | Thermocouple #: T3-4

Assumed Bws: | Filter #: QR2960

Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783

Post-Test Leak Rate: .001 cfm @ 5 in.Hg.

Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	~~16~~ 5:24	1725-1728	129.020											
2	~~16~~ 8:00	1735-1738	131.070	3.1	1.8	1.8	123	252	260	57	240	82	82	1.5
	168:00													

Final Readings → ΔVm = 126.979 | $\overline{\sqrt{\Delta p}}$ = 1.7585 | $\overline{\Delta H}$ = 1.76 | $\overline{Ts}$ = 120 | $\overline{Tm}$ = 78

$\overline{\Delta P}$ = 3.0941

EZ

EQ Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 8/30/16 Sample Box No. SB-3
Sample Location PRESSURE BH
Train Preparer EZ
Sample Recovery Person BF/CS
Comments M29 - Metals

Run No. P-5/29-1
Job No. 050074.0172
Filter No. Q22960
Sample Head No. 12
Barometer No. TVC.com
Balance No. 2

Front Half
Acetone
Container No. P-29-1 ACE
Liquid Level Marked ✓ Sealed ✓

Filter
Container No. Q22960 Sealed ✓

Description of Filter light grey loading

Samples Stored and Locked ✓

Back Half/Moisture
Container No. P-29-1 IMPS 1-3 / IMP 4 / KMnO4 IMPS / 8N HCl

Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	—	—	~~777.1~~		
2	5% HNO_3/10% H_2O_2	100	777.1	810.9	+ 33.8
3	5% HNO_3/10% H_2O_2	100	770.0	777.8	+ 7.8
4	—	—	674.9	676.2	+ 1.3
5	4% $KMnO_4$/10% H_2SO_4	100	781.4	781.2	- 0.2
6	4% $KMnO_4$/10% H_2SO_4	100	782.5	782.8	+ 0.3
7	~~Total~~ Silica Gel	250g	931.8	955.1	+23.3
Total					66.3

8/29 8/30
Purple Purple
Purple Purple

Description of Impinger Catch: Clear

1,024
EZ

EQM

FIELD DATA SHEET

pg 1 of 2

T3-4

Plant: AK Middletown Sample Type: M29 Operator: GD Nozzle ID: .156 Thermocouple #: [redacted]

Sampling Location: P Baghouse 3 Pbar: 30.05 Ps: -2.0 Assumed Bws: 1.7 Filter #: QE2959

Run Number: P-29-2 Date: 8-31-16 CO_2: CEM O_2: CEM Meter Box #: 13 Y: .989 ΔH@: 1.783

Pretest Leak Rate: .001 cfm @ 10 in.Hg. Probe Length/Type: 3'61 Pitot#: T3-4 Post-Test Leak Rate: .001 cfm @ 3 in.Hg.

Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 35.5" K: .6106 Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1020	131.400											
1	3:21	1024	133.885	3.0	1.7	1.7	98	249	256	64	238	68	68	1.0
2	6:49	1035-1039	136.513	2.9	1.7	1.7	107	258	257	60	239	69	69	1.0
3	10:03	1049-1052	138.873	2.9	1.6	1.6	118	250	257	58	237	70	70	1.0
4	13:22	1104-1107	141.257	3.0	1.7	1.7	121	256	258	59	238	71	71	1.0
5	16:49	1123-1126	143.780	3.0	1.7	1.7	123	260	257	58	239	72	72	1.0
6	20:21	1141-1145	146.362	3.0	1.7	1.7	122	260	259	59	240	73	73	1.0
1	23:51	1200-1204	148.938	3.2	1.8	1.8	121	262	260	57	238	74	74	1.0
2	27:24	1220-1224	151.628	3.2	1.8	1.8	122	263	260	56	241	75	75	1.0
3	30:53	1239-1242	154.277	3.2	1.8	1.8	122	265	260	57	239	76	76	1.0
4	34:21	1257-1301	156.860	3.0	1.7	1.7	121	256	260	57	238	77	77	1.0
5	37:49	1316-1320	159.413	3.0	1.7	1.7	120	260	261	59	239	78	78	1.0
6	41:21	1335-1339	162.095	3.0	1.7	1.7	116	258	258	60	238	79	79	1.0
1	44:52	1345-1349	164.726	3.0	1.7	1.7	118	261	260	59	239	80	80	1.0
2	48:07	1448-1452	167.174	3.1	1.8	1.8	111	256	261	58	238	79	80	1.0
3	51:26	1459-1502	169.621	3.1	1.8	1.8	115	254	259	57	237	79	79	1.0
4	54:42	1510-1513	172.054	3.2	1.8	1.8	112	250	260	58	237	79	79	1.0
5	58:12	1525-1529	174.767	3.1	1.8	1.8	117	252	260	59	238	79	79	1.0
6	61:32	1543-1546	177.363	3.2	1.8	1.8	110	256	260	58	240	78	78	1.0
1	64:51	1600-1603	179.933	3.2	1.8	1.8	112	254	259	60	240	77	77	1.0
2	68:14	1617-1620	182.525	3.3	1.9	1.9	110	257	260	58	237	77	77	1.0
3	71:32	1634-1637	185.134	3.4	1.9	1.9	112	257	258	59	238	76	76	1.0
4	75:10	1652-1655	188.020	3.4	2.0	2.0	108	251	259	56	236	75	75	1.0
5	78:34	1708-1713	190.768	3.5	2.0	2.0	100	261	260	57	235	75	75	1.0
6	81:52	1727-1730	193.475	3.5	2.0	2.0	98	260	258	58	237	73	73	1.0
1	85:05	1737-1740	196.109	3.5	2.0	2.0	99	261	259	59	236	73	73	1.0

LEAK ✓
196.109
196.268
.000c8"

ΔVm = _____ $\overline{\sqrt{\Delta p}}$ = _____ $\overline{\Delta H}$ = _____ $\overline{Ts}$ = _____ $\overline{Tm}$ = _____

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M29 | Operator: GD | Nozzle ID: .156 | Thermocouple #: T3-4
Sampling Location: P Baghouse 3 | Pbar: 30.08 | Ps: -2.0 | Assumed Bws: 1.7 | Filter #: QZ2459
Run Number: P-29-2 | Date: 9-1-16 | CO_2: CEM | O_2: CEM | Meter Box #: 13 | Y: .989 | ΔH@: 1.783
Pretest Leak Rate: 0.001 cfm @ 10 in.Hg. | Probe Length/Type: 3'6" | Pitot#: T3-4 | Post-Test Leak Rate: .001 cfm @ 4 in.Hg.
Pretest Leak Check: Pitot: √ | Orsat: – | Stack Diameter: 35.5" | K: .6106 | Post-Test Leak Check: Pitot: ✓ | Orsat: –

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	85:05	10:20	196.488											
2	88:23	10:23	199.038	3.5	2.0	2.0	99	251	259	59	236	66	67	1.0
3	91:42	1035-1038	201.637	3.5	2.0	2.0	98	250	260	54	237	67	67	1.0
4	95:05	1047-1050	204.270	3.4	1.9	1.9	107	250	258	52	239	66	66	1.0
5	98:25	1118-1121	206.946	3.3	1.9	1.9	108	260	258	53	240	66	66	2.0
6	101:43	1130-1133	209.475	3.1	1.7	1.7	110	252	259	54	237	66	66	2.0
1	105:05	1142-1145	211.981	3.0	1.7	1.7	110	254	260	53	238	66	66	2.0
2	108:25	1200-1204	214.432	3.1	1.8	1.8	107	260	259	54	238	67	66	1.5
3	111:50	1219-1223	217.033	3.3	1.9	1.9	105	261	259	57	239	67	67	1.5
4	115:14	1238-1242	219.695	3.2	1.8	1.8	114	259	258	57	237	68	67	1.5
5	118:26	1257-1300	222.017	3.1	1.7	1.7	115	256	260	58	237	68	68	1.5
6	121:54	1316-1319	224.789	3.1	1.8	1.8	110	255	259	59	240	69	68	1.5
1	125:24	1335-1339	227.320	3.1	1.8	1.8	111	260	260	60	237	69	68	1.0
2	128:41	1345-1349	229.785	3.1	1.8	1.8	112	259	259	58	238	70	69	1.0
3	132:00	1441-1445	232.274	3.2	1.8	1.8	106	258	260	57	236	70	70	1.0
4	135:14	1452-1455	234.756	3.3	1.9	1.9	112	258	259	56	239	70	70	1.5
5	138:31	1510-1513	237.262	3.3	1.9	1.9	110	260	261	58	240	70	70	1.5
6	141:45	1525-1528	239.642	3.2	1.8	1.8	116	256	261	59	239	71	70	1.5
1	144:58	1543-1546	242.087	3.2	1.8	1.8	111	256	258	60	238	70	70	1.5
2	148:06	1601-1605	244.457	3.2	1.8	1.8	110	250	259	60	240	70	70	1.5
3	151:30	1616-1620	246.941	3.3	1.9	1.9	112	251	259	61	239	70	70	1.5
4														
5														
6														
1														
2			115.162											

Port change

Final → ΔVm = ~~115.541~~ $\sqrt{\Delta p}$ = 1.7845 $\overline{\Delta H}$ = 1.81 $\overline{Ts}$ = 111 $\overline{Tm}$ = 72

~~3.79 (leak checks)~~ $\overline{\Delta P}$ = 3.1866

-.159

✓ IE2

SAMPLE RECOVERY DATA

Plant AK Steel Middletown — Run No. P-29-2
Date 8/31/16 — Sample Box No. SB-3 — Job No. 5074.0172
Sample Location Pushing Baghouse — Filter No. Q2 2959
Train Preparer DA — Sample Head No. 12
Sample Recovery Person DA — Barometer No. NIC. com
Comments Method 5/29 — Balance No. 2

8/31 - 9/1

Front Half
Acetone Container No. P-29-2 — Liquid Level Marked — — Sealed —

Filter
Container No. Q2 2957 — Sealed ✓

Description of Filter Light Gray

Samples Stored and Locked —

Back Half/Moisture
Container No. 4 HNO_3/H_2O_2, 4M Empty /HCl

Liquid Level Marked _____ Sealed _____

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	5% HNO_3/10% H_2O_2	100	780.2	807.8	27.6
2	5% HNO_3/10% H_2O_2	100	773.5	779.7	6.2
3	empty	—	678.4	679.6	1.2
4	knock-out	100	785.3	784.2	-1.1
5	knock-out	100	786.8	786.5	-0.3
6	SG	250	905.8	925.7	19.9
Total					53.5

Purple pm - 8/31 Amber - 9/1

Description of Impinger Catch: _____

✓ EZ

EQM P-5/29-3

FIELD DATA SHEET

pg 1 of 2

Plant: AK Middletown Sample Type: M5/29 Operator: GD

Sampling Location: Baghouse #3 Pbar: 30.20 Ps: -2.0

Run Number: P-3 Date: 9/6/16 CO_2: CEM O_2: CEM

Pretest Leak Rate: .003 cfm @ 8 in.Hg. Probe Length/Type: 3' GI Pitot#: T3-4

Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 35.5" K: .6106

Nozzle ID: .156 Thermocouple #: T3-4

Assumed Bws: 1.7 Filter #: QZ2961

Meter Box #: 13 Y: 0.989 ΔH@: 1.783

Post-Test Leak Rate: .001 cfm @ 10 in.Hg.

Post-Test Leak Check: Pitot: ✓ c Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	1026	247.319											
1	3:14	1029	249.758	3.3	1.9	1.9	100	258	260	58	236	70	70	1.0
2	6:30	1038-1041	252.183	3.2	1.8	1.8	108	261	261	57	238	71	71	1.0
3	9:49	1051-1054	254.675	3.4	1.9	1.9	111	262	259	56	239	72	71	1.0
4	13:51	1120-1124	257.725	3.4	1.9	1.9	112	258	258	57	240	73	73	1.0
5	17:08	1131-1135	260.214	3.4	1.9	1.9	114	261	258	56	241	74	74	1.0
6	20:23	1145-1148	262.818	3.4	1.9	1.9	116	262	260	55	240	76	75	1.0
1	23:42	1200-1204	265.432	3.3	1.9	1.9	117	260	258	57	239	77	76	1.0
2	27:05	1219-1223	268.177	3.4	1.9	1.9	117	261	260	58	239	77	77	1.0
3	30:23	1241-1245	270.775	3.2	1.8	1.8	121	259	260	56	240	79	78	1.0
4	33:44	1258-1301	273.188	3.3	1.9	1.9	120	262	260	57	238	80	80	1.0
5	36:58	1316-1320	275.669	3.2	1.8	1.8	120	258	260	58	239	82	81	1.0
6	40:14	1337-1340	278.144	3.1	1.7	1.7	129	258	261	59	240	82	82	1.0
1	43:40	1352-1355	280.815	3.2	1.8	1.8	129	262	259	58	240	82	82	1.0
2	47:04	1441-1444	283.234	2.7	1.5	1.5	122	259	261	59	239	82	82	1.0
3	50:20	1455-1458	285.515	2.7	1.5	1.5	133	258	259	57	240	82	82	1.0
4	53:38	1509-1512	287.823	2.8	1.6	1.6	131	263	260	59	239	82	82	1.0
5	56:49	1525-1528	290.130	3.0	1.7	1.7	128	253	259	55	239	82	82	1.0
6	60:08	1542-1546	292.502	3.0	1.7	1.7	127	256	258	56	238	82	82	1.0
1	63:27	1559-1603	295.065	3.0	1.7	1.7	129	252	263	57	240	82	82	1.0
2	66:39	1616-1619	297.676	3.2	1.8	1.8	130	261	257	57	241	83	82	1.0
3	69:59	1633-1637	300.215	3.2	1.8	1.8	128	259	257	58	241	83	82	1.0
4	73:14	1652-1655	302.671	3.2	1.8	1.8	127	261	255	58	238	83	83	1.0
5	76:35	1708-1711	305.177	3.2	1.8	1.8	129	258	262	59	239	83	83	1.0
6	79:46	1725-1728	307.587	3.1	1.7	1.7	128	259	260	58	240	83	83	1.0
1	83:06	1735-1739	310.132	3.2	1.8	1.8	124	262	261	57	239	83	83	1.0

Port change →

ΔVm = 62.813 $\overline{\sqrt{\Delta p}}$ = ______ $\overline{\Delta H}$ = ______ $\overline{Ts}$ = ______ $\overline{Tm}$ = ______

EQM P-5129-3

FIELD DATA SHEET

pg 2 of 2

Plant: AK Middletown | Sample Type: M5/~~202~~ 29 | Operator: GD | Nozzle ID: .156 | Thermocouple #: T3-4

Sampling Location: Baghouse #3 | Pbar: 30.16 | Ps: -2.0 | Assumed Bws: 1.7 | Filter #: QE 29601

Run Number: ~~P-5129-~~ 3 | Date: 9/7/16 | CO_2: CEM | O_2: CEM | Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783

Pretest Leak Rate: .001 cfm @ 5 in.Hg. | Probe Length/Type: 3'61 | Pitot#: T3-4 | Post-Test Leak Rate: .001 cfm @ 3 in.Hg.

Pretest Leak Check: Pitot: ✓ Orsat: — | Stack Diameter: 35.5" | K: .6106 | Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	83:06	1051	310.382											
2	86:22	1054	312.867	3.1	1.8	1.8	106	254	260	60	240	72	72	1.0
3	89:41	1104-1107	315.335	3.0	1.7	1.7	118	262	258	56	239	75	74	1.0
4	92:52	1116-1120	317.778	2.8	1.6	1.6	127	261	260	55	241	76	75	1.0
5	96:06	1129-1132	320.209	3.1	1.7	1.7	133	260	259	54	240	77	76	1.0
6	99:25	1141-1144	322.672	3.1	1.7	1.7	134	260	259	57	238	78	77	1.0
1	102:38	1154-1157	325.126	3.2	1.8	1.8	130	259	259	56	239	78	77	1.0
2	105:52	1506-1510	327.563	3.2	1.8	1.8	123	262	259	55	240	82	82	1.0
3	109:11	1520-1524	330.106	3.2	1.8	1.8	124	260	260	56	237	84	84	1.0
4	112:21	1534-1537	332.488	3.0	1.7	1.7	129	264	258	55	239	86	85	1.0
5	115:42	1547-1550	335.038	3.1	1.8	1.8	127	262	258	57	238	86	86	1.0
6	119:05	1601-1604	337.643	3.1	1.8	1.8	128	260	258	58	237	87	86	1.0
1	122:25	1616-1619	340.217	3.1	1.8	1.8	129	263	260	59	237	87	86	1.0
2	125:42	1629-1632	342.761	3.2	1.8	1.8	129	263	260	58	238	87	87	1.0
3	128:56	1643-1646	345.261	3.2	1.8	1.8	127	258	261	57	237	87	87	1.0
4	132:17	1657-1700	347.807	3.0	1.7	1.7	129	262	259	58	239	86	86	1.0
5	135:34	1712-1715	350.336	3.1	1.8	1.8	125	260	260	59	240	85	85	1.0
6	138:56	1725-1729	352.999	3.1	1.8	1.8	124	259	259	57	238	85	85	1.0
1	142:29	1739-1743	355.653	3.1	1.8	1.8	126	258	257	58	239	84	84	1.0
2	145:41	1753-1757	358.138	3.1	1.8	1.8	127	259	260	57	240	84	84	1.0
3														
4														
5														
6														
1														
2														

ΔVm = 110.569 $\sqrt{\Delta p}$ = ~~GD 1.7697~~ ~~1.7701~~ $\overline{\Delta P}$ GD ~~3.1357~~ 3.1341 | $\overline{\Delta H}$ = ~~1.77~~ GD | $\overline{Ts}$ = 124 | $\overline{Tm}$ = ~~GD~~ 80 81

-.25 from leak checks

/E2

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel Middletown
Run No. P-5/29-3
Date 9/7/16
Sample Box No. SB-3
Job No. 5007401.72
Sample Location Pushing Baghouse
Filter No. QZ 2961
Train Preparer CS
Sample Head No. 12
Sample Recovery Person DA
Barometer No. IWC
Comments M 5/29
Balance No. 2

Front Half
Acetone / HNO_3
Liquid
Container No. P-5/29-3
Level Marked —
Sealed ✓

Filter
Container No. QZ 2961
Sealed ✓

Description of Filter Light Gray

Samples Stored and Locked ✓

Back Half/Moisture
Container No. HNO_3/H_2O_2; 4th Imp Empty; $KMnO_4$; HCl

Liquid Level Marked —
Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	5% HNO_3/10% H_2O_2	100	779.1	808.5	29.4
2	5% HNO_3/10% H_2O_2	100	772.4	780.9	8.5
3	—	—	676.7	677.7	1.0
4	$KMnO_4$	100	794.4	792.8	-1.6
5	$KMnO_4$	100	769.0	769.0	0
6	SG	250	928.9	950.6	21.7
Total					59.0

Description of Impinger Catch: Clear - $KMnO_4$ purple @ end

✓ 122

EQM

FIELD DATA SHEET

Plant: AK Steel Middletown Sample Type: 5/29 Operator: NP
Sampling Location: Condensation Stack Pbar: 30.20 Ps: -0.80
Run Number: C-5/29-1 Date: 9/6/16 CO_2: 3 O_2: 15
Pretest Leak Rate: 0.002 cfm @ 10 in.Hg. Probe Length/Type: 6' G Pitot#: TG-15P
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 168" K: 53.113

Nozzle ID: 0.500 Thermocouple #: TG-15P
Assumed Bws: 10 Filter #: QZ 2956
Meter Box #: 2 Y: 1.005 ΔH@: 1.687
Post-Test Leak Rate: ____ cfm @ ____ in.Hg.
Post-Test Leak Check: Pitot: ____ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	1002	770.192											
1	5	1007	773.03	.03	1.1	1.1	351	250	250	65	NA	76	76	1
2	10	1012	775.8	.03	1.1	1.1	340	250	251	65		76	77	1
3	15	1017	778.2	.02	.7	.7	350	234	236	62		77	77	1
4	20	1022	780.9	.03	1.1	1.1	350	237	232	58		78	77	1
5	25	1027	784.2	.04	1.4	1.4	340	234	234	58		80	77	1
6	30	1032	787.5	.04	1.4	1.4	341	234	234	58		83	78	1
7	35	1037	790.8	.04	1.4	1.4	349	234	233	59		85	79	1
8	40	1042	794.3	.04	1.5	1.5	330	234	235	61		86	79	2
9	45	1047	798.0	.04	1.5	1.5	297	234	235	61		88	80	3
10	50	1052	801.7	.04	1.5	1.5	293	235	235	62		90	81	3
11	55	1057	805.3	.04	1.5	1.5	293	233	234	64		91	81	3
12	60	1102	809.1	.04	1.5	1.5	290	234	234	65		92	82	3
1	65	1107	812.8	.04	1.5	1.5	294	233	234	65		93	83	3
2	70	1112	816.7	.04	1.6	1.6	292	234	234	60		94	84	3
3	75	1117	820.5	.04	1.5	1.5	301	232	233	56		95	85	3
4	80	1122	824.2	.04	1.5	1.5	313	234	234	56		97	86	3
5	85	1127	827.9	.04	1.5	1.5	320	234	234	56		97	87	3
6	90	1132	831.7	.04	1.5	1.5	320	235	234	57		98	88	3
7	95	1137	835.3	.04	1.5	1.5	313	234	235	56		98	88	3
8	100	1142	838.8	.04	1.5	1.5	314	234	233	57		99	89	3
9	105	1147	842.3	.04	1.5	1.5	291	234	233	59		99	90	3
10	110	1152	845.8	.04	1.5	1.5	276	233	233	59		99	90	3
11	115	1157	849.3	.04	1.5	1.5	278	234	235	61		100	91	3
12	120	1202	852.9	.04	1.5	1.5	281	234	234	62		100	92	3

ΔVm = ______ $\sqrt{\Delta p}$ = ______ $\overline{\Delta H}$ = ______ $\overline{Ts}$ = ______ $\overline{Tm}$ = ______

EQM

FIELD DATA SHEET

Plant: AK Middletown Sample Type: 5/29 Operator: NP
Sampling Location: Combustion Stack Pbar: 30.20 Ps: -.80
Run Number: C-5/29/1 Date: 9-6-16 CO_2: 3 O_2: 15
Pretest Leak Rate: .001 cfm @ 10 in.Hg. Probe Length/Type: 6' GL Pitot#: TG-15P
Pretest Leak Check: Pitot: ✓± Orsat: – Stack Diameter: 168" K: 53.113

Nozzle ID: .500 Thermocouple #: TG-15P
Assumed Bws: .10 Filter #: 022956
Meter Box #: 2 Y: 1.005 ΔH@: 1.687
Post-Test Leak Rate: .003 cfm @ 6 in.Hg.
Post-Test Leak Check: Pitot: ✓± Orsat: –

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
1	1207	125	856.6	.04	1.5	1.5	288	234	232	63	NA	101	92	3
2	1212	130	860.1	.04	1.5	1.5	283	234	234	63		101	92	3
3	1217	135	863.7	.05	1.9	1.9	305	234	236	58		102	93	3
4	1222	140	867.6	.05	1.9	1.9	325	234	236	57		103	94	3
5	1227	145	871.5	.05	1.9	1.9	327	233	233	57		104	95	3
6	1232	150	875.4	.05	1.9	1.9	318	235	235	57		105	95	3
1	155	1237	879.3	.05	1.9	1.9	330	234	234	57		105	95	3
2	160	1242	883.2	.05	1.9	1.9	335	233	234	57		105	96	3
3	165	1247	887.1	.04	1.6	1.6	277	236	234	59		106	96	3
4	170	1252	890.7	.04	1.6	1.6	288	235	234	60		106	97	3
5	175	1257	894.2	.04	1.6	1.6	289	234	234	59		100	95	3
6	180	1302	897.840	.04	1.6	1.6	297	234	234	59		100	95	3

ΔVm = 127.648 $\sqrt{\Delta p}$ = .2001 $\overline{\Delta H}$ = 1.5167 $\overline{Ts}$ = 311 $\overline{Tm}$ = 91

Ave DP = .0403

E2

150 = 99.3%

SAMPLE RECOVERY DATA

Plant AK MIDDLETOWN
Run No. C-5/29-1
Date 9/6/16
Sample Box No. _____
Job No. 050074.0172
Sample Location COMBUSTION STACK
Filter No. QZ 2956
Train Preparer CJ
Sample Head No. S/P-9
Sample Recovery Person CJ
Barometer No. TWC.com
Comments 5/29
Balance No. 2

Front Half
Acetone C-5/29-1 Liquid
Container No. FRONT 1/2 ACE / Level Marked ✓ Sealed ✓
01 D HNO3 RINSE

Filter
Container No. QZ-2956 Sealed ✓

Description of Filter black coarse

Samples Stored and Locked ✓

Back Half/Moisture
Container No. C-5/29-1 IMP 1-3 / IMP 4 / KMnO4 / H2O + 8N HCl

Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	—	—	664.5	844.0	179.5
2	5% HNO_3/10% H_2O_2	100	779.0	853.6	74.6
3	5% HNO_3/10% H_2O_2	100	763.2	784.8	21.6
4	—	—	651.2	653.6	2.4
5	$KMnO_4$	100	765.4	762.5	-2.9
6	$KMnO_4$	100	805.3	807.6	2.3
7	~~Total~~ SG	250	927.7	951.1	23.4
				TOTAL	300.9

Description of Impinger Catch: clear / purple

EZ

BWS = 10.2%

EQM

FIELD DATA SHEET

Plant: AK Middletown
Sampling Location: Combustion Stack
Run Number: C-5/29-2 Date: 9-7-16
Pretest Leak Rate: 0.002 cfm @ 11 in.Hg.
Pretest Leak Check: Pitot: √ Orsat: —

Sample Type: 5/29 Operator: NP
Pbar: 30.16 Ps: -0.75"
CO_2: 3 O_2: 15
Probe Length/Type: 6' GL Pitot#: T6-15P
Stack Diameter: 166" K: 53.113

Nozzle ID: 0.500 Thermocouple #: T6-15P
Assumed Bws: 10 Filter #: QZ 2962
Meter Box #: 2 Y: 1.005 ΔH@: 1.687
Post-Test Leak Rate: — cfm @ — in.Hg.
Post-Test Leak Check: Pitot: — Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	840	939.326											
1	5	845	942.6	.04	1.5	1.5	262	263	265	65	140	69	64	2
2	10	850	946.0	.04	1.5	1.5	269	265	267	64	151	70	69	2
3	15	855	949.5	.04	1.5	1.5	275	265	265	53	227	71	70	2
4	20	900	952.7	.03	1.2	1.2	261	265	265	52	244	73	70	2.5
5	25	905	956.0	.04	1.4	1.4	334	264	265	53	259	75	71	3
6	30	910	959.5	.04	1.4	1.4	324	264	264	54	267	77	72	3
7	35	915	963.0	.04	1.4	1.4	327	264	265	55	271	78	72	3
8	40	920	966.5	.04	1.4	1.4	328	264	264	56	275	80	73	3
9	45	925	970.0	.04	1.4	1.4	320	264	264	56	274	82	74	3
10	50	930	973.5	.04	1.5	1.5	328	265	265	57	277	84	75	3
11	55	935	977.0	.04	1.5	1.5	327	263	264	58	277	84	76	3
12	60	940	980.9	.04	1.5	1.5	329	264	263	58	276	85	77	3
1	65	945	984.0	.04	1.5	1.5	294	263	264	60	274	85	78	3
2	70	950	987.5	.04	1.5	1.5	302	264	264	60	274	85	78	3
3	75	955	991.1	.04	1.5	1.5	290	264	264	60	274	86	78	3
4	80	1000	994.6	.04	1.5	1.5	303	265	265	63	273	86	79	3
5	85	1005	998.2	.04	1.5	1.5	306	264	265	63	273	86	79	3
6	90	1010	1001.7	.04	1.5	1.5	291	263	264	63	273	86	79	3
7	95	1015	1005.2	.04	1.5	1.5	314	264	263	64	273	87	79	3
8	100	1020	1008.8	.04	1.5	1.5	305	264	264	65	274	87	80	3
9	105	1025	1012.4	.04	1.5	1.5	314	265	264	61	275	87	80	3
10	110	1030	1015.9	.04	1.5	1.5	311	263	264	59	275	87	80	3
11	115	1035	1019.5	.04	1.5	1.5	317	264	264	59	274	88	80	3
12	120	1040	1023.0	.04	1.5	1.5	318	265	264	59	275	88	80	3

51.8

ΔVm = _____ $\overline{\sqrt{\Delta p}}$ = _____ $\overline{\Delta H}$ = _____ $\overline{Ts}$ = _____ $\overline{Tm}$ = _____

EQM

FIELD DATA SHEET

Plant: AK Middletown
Sampling Location: Combustion Stack
Run Number: C-5/29-2 Date: 9-7-16
Pretest Leak Rate: .002 cfm @ 11 in.Hg.
Pretest Leak Check: Pitot: √± Orsat: —

Sample Type: 5/29 Operator: NP
Pbar: 30.16 Ps: -.75"
CO_2: 3 O_2: 15
Probe Length/Type: 6' G Pitot#: TG-15P
Stack Diameter: 168" K: 53.13

Nozzle ID: .500 Thermocouple #: TG-15P
Assumed Bws: 10 Filter #: 07 2962
Meter Box #: 2 Y: 1.005 ΔH@: 1.687
Post-Test Leak Rate: .002 cfm @ 8 in.Hg.
Post-Test Leak Check: Pitot: √± Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
Ø														
1	125	1045	1026.6	.04	1.5	1.5	289	264	264	56	274	89	81	3
2	130	1050	1030.3	.04	1.5	1.6	272	264	264	53	282	89	81	3
3	135	1055	1033.9	.04	1.5	1.5	279	265	264	53	271	89	82	3
4	140	1100	1037.5	.04	1.5	1.5	291	265	264	53	270	89	82	3
5	145	1105	1041.1	.04	1.5	1.5	293	264	264	53	288	90	82	3
6	150	1110	1044.6	.04	1.5	1.5	292	267	264	55	271	90	82	3
7	155	1115	1047.9	.03	1.2	1.2	284	263	264	55	271	90	83	3
8	160	1120	1051.5	.04	1.5	1.5	309	265	265	57	272	90	83	3
9	165	1125	1055.0	.04	1.5	1.5	314	267	265	57	272	91	83	3
10	170	1130	1059.1	.04	1.5	1.5	316	266	263	59	273	91	84	3
11	175	1135	1062.0	.04	1.5	1.5	297	264	265	60	273	92	84	3
12	180	1140	1065.539	.04	1.5	1.5	301	264	264	60	273	92	84	3

$\Delta Vm = 126.213\sqrt{\Delta p} = .1985$ $\overline{\Delta H} = 1.469$ $\overline{Ts} = 302$ $\overline{Tm} = 81$ 80

Ave DP = .0394

EZ EZ

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel - Middletown
Date 9/7/16 Sample Box No. HSB-4
Sample Location Common Stack
Train Preparer DA
Sample Recovery Person DA
Comments M29 - Metals

Run No. C-5/29-2
Job No. 5207 4.0172
Filter No. QZ 2962
Sample Head No. 9
Barometer No. TVC.com
Balance No. 2

Front Half
Acetone/HNO3
Container No. C-5/29-2 Liquid Level Marked ✓ Sealed ✓

Filter
Container No. QZ2962 Sealed ✓

Description of Filter Black Loading

Samples Stored and Locked ✓

Back Half/Moisture
Container No. 4 HNO3/H2O2; 4th Impinger, KMnO4/HCl

Liquid Level Marked _____ Sealed _____

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	empty	—	669.3	850.9	181.6
2	5%/10%	100	780.5	855.6	75.1
3	5% HNO3/10% H2O2	100	767.1	783.9	16.8
4	empty	—	653.2	655.9	2.7
5	KMnO4	100	774.7	775.1	0.4
6	KMnO4	100	803.9	804.3	0.4
Total					303.0

Description of Impinger Catch: Clear - purple KMnO4

7	SG	250	935.7	961.7	26.0

✓ EZ

Bws = 10.2%
Bso = 100.2%

EQM

FIELD DATA SHEET

Plant: AK Middletown Sample Type: 5/29 Operator: NP

Sampling Location: Combustion Stack Pbar: 30.16 Ps: -.75

Run Number: C-5/29-3 Date: 9-7-16 CO_2: 3 O_2: 15

Pretest Leak Rate: .001 cfm @ 10 in.Hg. Probe Length/Type: 6' GL Pitot#: 76-15P

Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 168" K: 53.113

Nozzle ID: .500 Thermocouple #: T6-15P

Assumed Bws: .10 Filter #: QT2455

Meter Box #: 2 Y: 1.005 ΔH@: 1.687

Post-Test Leak Rate: ____ cfm @ ____ in.Hg.

Post-Test Leak Check: Pitot: ____ Orsat: ____

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1230	65.820											
1	5	1235	69.9	.04	1.6	1.6	268	259	266	65	153	83	83	3
2	10	1240	73.1	.04	1.6	1.6	273	264	268	58	229	84	84	3
3	15	1245	76.8	.04	1.6	1.6	285	267	266	58	233	85	84	3
4	20	1250	80.5	.04	1.6	1.6	293	263	266	59	243	87	84	3
5	25	1255	84.0	.04	1.6	1.6	286	265	265	58	250	90	84	3
6	30	1300	87.7	.04	1.6	1.6	277	264	263	61	252	92	85	3
7	35	1305	91.3	.04	1.6	1.6	278	263	263	64	254	94	86	3
8	40	1310	94.8	.04	1.6	1.6	282	263	262	64	255	95	86	3
9	45	1315	98.4	.04	1.6	1.6	239	263	263	64	255	95	87	3
10	50	1320	102.4	.04	1.6	1.6	263	266	265	65	256	95	87	3
11	55	1325	105.7	.04	1.6	1.6	267	264	264	65	255	96	88	3
12	60	1330	109.4	.04	1.6	1.6	272	263	263	65	259	97	88	3
1	65	1335	113.1	.04	1.6	1.6	278	262	263	64	259	97	89	3
2	70	1340	116.8	.04	1.6	1.6	275	263	263	60	261	98	89	3
3	75	1345	120.4	.04	1.6	1.6	276	265	264	60	261	98	89	3
4	80	1350	124.1	.04	1.6	1.6	287	263	264	61	259	98	90	3
5	85	1355	127.6	.04	1.6	1.6	281	263	266	61	258	99	90	3
6	90	1400	131.4	.04	1.6	1.6	285	264	264	62	258	99	90	3
7	95	1405	135.2	.04	1.6	1.6	291	264	263	64	258	100	90	3
8	100	1410	138.8	.04	1.6	1.6	281	264	264	67	260	99	91	3
9	105	1415	142.5	.04	1.6	1.6	281	265	264	65	261	99	91	3
10	110	1420	146.5	.04	1.6	1.6	263	263	266	61	260	99	91	3
11	115	1425	149.8	.04	1.6	1.6	271	265	264	60	260	99	92	3
12	120	1430	153.6	.04	1.6	1.6	280	265	264	59	261	99	92	3

$\Delta Vm =$ _____ $\overline{\sqrt{\Delta p}} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

EQM

FIELD DATA SHEET

Plant: AK Middletown Sample Type: 5/29 Operator: NP

Sampling Location: Combustion Stack Pbar: 30.16 Ps: -.75

Run Number: C-5/29-3 Date: 9-7-16 CO_2: 3 O_2: 15

Pretest Leak Rate: .001 cfm @ 10 in.Hg. Probe Length/Type: 6' GL Pitot#: T6-15P

Pretest Leak Check: Pitot: ✓± Orsat: – Stack Diameter: 168" K: 53.113

Nozzle ID: .500 Thermocouple #: T6-15P

Assumed Bws: 10 Filter #: Q72958

Meter Box #: 2 Y: 1.003 ΔH@: 1.683

Post-Test Leak Rate: 0.002 cfm @ 7 in.Hg.

Post-Test Leak Check: Pitot: ✓± Orsat: –

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
1	125	1435	157.3	.04	1.6	1.6	290	264	264	63	260	99	92	3
2	130	1440	161.1	.04	1.6	1.6	291	264	264	63	261	99	92	3
3	135	1445	165.0	.04	1.6	1.6	287	265	263	63	261	100	92	3
4	140	1450	168.7	.04	1.6	1.6	288	264	264	65	261	99	92	3
5	145	1455	172.4	.04	1.6	1.6	299	263	264	62	260	99	92	3
6	150	1500	176.3	.04	1.6	1.6	297	263	264	59	261	100	92	3
7	155	1505	180.1	.04	1.6	1.6	305	265	264	59	261	100	92	3
8	160	1510	183.8	.04	1.6	1.6	300	265	264	59	262	100	93	3
9	165	1515	187.6	.04	1.6	1.6	303	265	264	59	261	100	92	3
10	170	1520	191.4	.04	1.6	1.6	266	263	264	62	260	100	93	3
11	175	1525	195.1	.04	1.6	1.6	271	264	264	62	260	100	93	3
12	180	1530	198.850	.04	1.6	1.6	280	264	264	63	260	100	93	3

ΔVm = 133.030 $\sqrt{\Delta p}$ = .2000 $\overline{\Delta H}$ = 1.6 $\overline{Ts}$ = 281 $\overline{Tm}$ = 93

Ave Δp = .0400

EZ

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/7/16 Sample Box No. HSB-4
Sample Location Combustion
Train Preparer EZ / DA
Sample Recovery Person DA
Comments M29-Metals

Run No. C-29-3
Job No. 50074.0172
Filter No. Q2 2958
Sample Head No. 9
Barometer No. TWC
Balance No. 2

Front Half
Acetone/HNO3 Container No. C-2943 Liquid Level Marked — Sealed ✓

Filter
Container No. Q2 2958 Sealed ✓

Description of Filter Black

Samples Stored and Locked ✓

Back Half/Moisture
Container No. 4 HNO3/H2O2, Empty, KMnO4, HCl

Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	—	—	651.9	889.6	237.7
2	5% HNO_3/10% H_2O_2	100	792.6	862.8	70.2
3	5% HNO_3/10% H_2O_2	100	780.6	795.6	15.0
4	—	—	662.3	664.5	2.2
5	4% $KMnO_4$/10% H_2SO_4	100	780.1	778.7	-1.4
6	4% $KMnO_4$/10% H_2SO_4	100	767.5	771.1	3.6
7	~~Total~~	250g	948.9	972.6	23.7
Total					351.0

Description of Impinger Catch: clear
KMnO4 - Purple

EZ

$PM_{2.5}$ FILTERABLE AND CONDENSABLE

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M6-202 | Operator: EZ
Sampling Location: Baghouse Stack 2 | Pbar: 30.11 | Ps: -0.85
Run Number: BB-202-1 | Date: 8/29/16 | CO_2: CEM | O_2: CEM
Pretest Leak Rate: 0.002 cfm @ 10 in.Hg. | Probe Length/Type: 3' GL | Pitot#: T3-2
Pretest Leak Check: Pitot: √± | Orsat: – | Stack Diameter: 35.5" | K: .25221

Nozzle ID: 2148 | Thermocouple #: T3-2
Assumed Bws: .25 | Filter #: 832610
Meter Box #: 5 | Y: .993 | ΔH@: 1.906
Post-Test Leak Rate: 0.001 cfm @ 5 in.Hg. } End of Day 1
Post-Test Leak Check: Pitot: √± | Orsat: –

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1024	835.117											
1	3:29	1024-27	837.275	2.5	1.2	1.2	93	263	268	65	80	68	68	4
2	6:46	1036-39	839.248	2.3	1.1	1.1	104	260	265	65	81	70	70	3.5
3	9:49	1049-52	841.189	2.4	1.2	1.2	124	262	265	64	82	71	71	3.5
4	12:56	1103-06	843.117	2.5	1.3	1.3	118	264	265	63	82	72	72	3.5
5	16:19	1121-24	845.116	2.6	1.2	1.2	124	257	264	62	84	73	73	3.5
6	19:48	1140-43	847.335	2.7	1.3	1.3	120	257	265	63	84	75	74	3.5
1	23:13	1159-202	849.359	2.8	1.3	1.3	120	266	266	62	84	75	75	3.5
2	26:38	1217-21	851.407	2.6	1.2	1.2	131	257	264	61	83	77	76	3.5
3	30:00	1241-45	853.404	2.4	1.1	1.1	130	259	264	62	82	78	77	3.5
4	33:22	1255-59	855.420	2.6	1.3	1.3	125	261	266	63	82	78	77	3.5
5	36:40	1310-14	857.427	2.4	1.2	1.2	127	258	264	64	82	81	79	3.5
6	40:02	1322-25	859.450	2.5	1.2	1.2	128	263	264	61	80	81	80	3.5
1	43:26	1345-49	861.448	2.2	1.1	1.1	122	256	265	62	81	82	81	3.5
2	46:56	1440-44	863.623	3.0	1.5	1.5	113	264	266	61	81	83	83	4
3	50:17	1453-56	865.835	3.0	1.5	1.5	120	268	265	60	82	83	82	4
4	53:47	1506-10	868.100	3.1	1.5	1.5	125	265	267	61	81	83	83	4
5	57:07	1522-25	870.215	2.8	1.3	1.3	129	262	264	62	80	83	83	3.5
6	60:33	1540-43	872.418	2.9	1.4	1.4	123	264	265	63	79	84	83	4
1	63:51	1557-600	874.591	3.2	1.5	1.5	127	254	262	64	79	83	83	4
2	67:22	1614-18	876.992	3.4	1.6	1.6	125	261	265	65	78	83	83	4.5
3	70:38	1631-35	879.288	3.1	1.5	1.5	124	259	267	64	79	83	83	4
4	73:44	1650-53	881.444	3.1	1.5	1.5	126	261	265	65	82	83	83	4
5	76:58	1706-09	883.541	2.6	1.3	1.3	126	259	264	62	82	83	83	3.5
6	80:15	1723-26	885.747	3.0	1.4	1.4	127	261	265	61	82	83	83	3.5
1	83:32	1737-40	888.279	2.8	1.4	1.4	125	260	265	60	80	83	83	3.5

ΔVm = _____ $\overline{\sqrt{\Delta p}}$ = _____ $\overline{\Delta H}$ = _____ $\overline{Ts}$ = _____ $\overline{Tm}$ = _____

ΔV_m Day 1 = 53.162

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M5-202 | Operator: EZ
Sampling Location: Bighouse Stack 2 | Pbar: 30.23 | Ps: -0.85
Run Number: PB-202-1 | Date: 8/30/16 | CO_2: CEM | O_2: CEM
Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 3' GL | Pitot#: T3-2
Pretest Leak Check: Pitot: ± | Orsat: ~ | Stack Diameter: 35.5" | K: 0.5221
Nozzle ID: 0.148 | Thermocouple #: T3-2
Assumed Bws: 2.5 | Filter #: 832610
Meter Box #: 5 | Y: 0.993 | ΔH@: 1.906
Post-Test Leak Rate: .001 cfm @ 10 in.Hg.
Post-Test Leak Check: Pitot: ✓ | Orsat: —

Beginning of Pkg 2

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	83:32	1026	888.455											
2	86:52	1026-29	890.476	2.6	1.3	1.3	96	255	262	65	80	71	70	3.5
3	90:13	1043-46	892.538	2.6	1.3	1.3	105	265	264	62	79	72	72	3.5
4	93:34	1189-22	894.672	2.9	1.4	1.4	111	265	265	63	80	73	73	4
5	96:54	1139-42	896.769	2.9	1.4	1.4	113	259	265	62	80	75	74	4
6	100:16	1201-04	899.017	3.3	1.6	1.6	120	259	264	60	80	76	76	4.5
1	103:39	1211-14	901.229	3.1	1.5	1.5	125	262	265	60	80	77	77	4
2	107:01	1221-24	903.389	3.0	1.4	1.4	128	263	266	62	84	82	81	4
3	110:07	1231-34	905.404	2.9	1.4	1.4	130	259	264	61	83	84	83	4
4	113:31	1245-48	907.616	3.0	1.4	1.4	130	262	265	62	85	84	84	4
5	116.58	1258-1302	909.830	3.0	1.4	1.4	131	258	265	62	85	85	84	4
6	120:16	1316-19	911.989	3.0	1.4	1.4	133	259	265	63	84	86	86	4
1	123:42	1335-39	914.263	3.1	1.5	1.5	136	259	265	64	85	87	86	4
one push 2a	125:12	1345-47	915.174	3.2	1.5	1.5	140	261	264	65	85	87	87	4
2b	128:25	1348-51	917.431	3.2	1.5	1.5	133	260	265	65	85	87	87	4
1														
			✓											

ΔVm = 82.138 $\sqrt{\Delta p}$ = 1.6794 $\overline{\Delta H}$ = 1.36 $\overline{Ts}$ = 120 / 123 BF

$\overline{\Delta p}$ = 2.8282

$\overline{Tm}$ = 79

VBF

SAMPLE RECOVERY DATA

Plant AK Middletown
Run No. P-202-1
Date 6/30/16
Sample Box No. SB-17
Job No. 050024.0172
Sample Location Pushing Baghouse
Filter No. 832610
Train Preparer EZ/CD
Sample Head No. SH-1
Sample Recovery Person BF
Barometer No. TWC.cm
Comments MS-202
Balance No. FB-2

Front Half
Acetone
Container No. 202-1
Liquid Level Marked ✓
Sealed ✓

Filter
Container No. 832610
Sealed ✓

Description of Filter Light gray dots

Samples Stored and Locked ✓

Back Half/Moisture
Container No. ✓

Liquid Level Marked ✓
Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	—	—	488.5	595.0	106.5
2	—	—	675.3	674.8	-0.5
3	H_2O	100	615.2	621.2	6
4	Silica Gel	250g	935.7	964.3	28.6
5					
6					-100.0
Total					40.6

+100 mL Type II H_2O

Description of Impinger Catch: clear

23% BWS

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M5-202 | Operator: EZ
Sampling Location: Baghouse Stack 2 | Pbar: 30.05 | Ps: -0.86
Run Number: PB-202-2 | Date: 8/31/16 | CO_2: CEM | O_2: CEM
Pretest Leak Rate: .001 cfm @ 9 in.Hg. | Probe Length/Type: 3'GL | Pitot#: T3-2
Pretest Leak Check: Pitot: ✓ | Orsat: ~ | Stack Diameter: 35.5" | K: 0.5221

Nozzle ID: 0.148 | Thermocouple #: T3-2
Assumed Bws: 2.5 | Filter #: 832594
Meter Box #: 5 | Y: 0.993 | ΔH@: 1.906
Post-Test Leak Rate: .001 cfm @ 7 in.Hg. } End of Day 1
Post-Test Leak Check: Pitot: ✓ | Orsat: ~

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1020	917.744											
1	3:20	1020-24	919.843	2.8	1.4	1.4	102	258	264	62	82	75	75	5
2	6:42	1035-39	921.910	2.6	1.3	1.3	117	262	263	61	81	76	76	5
3	9:58	1049-52	923.872	2.5	1.2	1.2	127	262	265	62	81	77	76	5
4	13:19	1104-07	925.884	2.5	1.2	1.2	134	255	263	61	81	78	77	5
5	16:40	1123-26	927.905	2.6	1.2	1.2	138	255	266	61	82	80	79	5
6	20:00	1141-45	929.907	2.6	1.2	1.2	134	261	264	62	81	81	80	5
1	23:18	1200-04	932.204	3.5	1.7	1.7	133	262	267	60	80	82	81	6.5
2	26:41	1220-24	934.463	3.1	1.5	1.5	130	263	266	61	81	82	82	6
3	30:02	1238-42	936.770	3.1	1.5	1.5	130	265	264	62	82	84	83	6
4	33:23	1257-1301	939.044	3.3	1.6	1.6	134	256	265	63	84	84	84	6
5	36:44	1316-20	941.302	3.3	1.6	1.6	135	264	265	63	82	85	85	6
6	40:04	1335-39	943.534	3.0	1.4	1.4	138	257	264	64	83	85	85	5.5
1	43:26	1345-49	945.791	3.2	1.5	1.5	129	259	267	64	85	86	86	6
2	46:49	1448-52	948.002	2.5	1.2	1.2	123	256	259	59	80	85	85	5
3	50:09	1459-1502	950.201	2.7	1.3	1.3	124	263	258	59	76	85	85	5
4	53:22	1510-13	952.240	2.7	1.3	1.3	116	261	259	58	74	84	84	5
5	56:50	1525-29	954.465	2.6	1.3	1.3	119	260	273	59	75	84	84	5
6	60:10	1543-46	956.634	2.6	1.3	1.3	120	260	270	60	80	83	83	5
1	63:29	1600-03	958.739	2.5	1.2	1.2	122	262	266	61	82	83	82	5
2	66:52	1617-21	960.309	2.5	1.2	1.2	125	260	266	63	84	82	82	5
3	70:07	1634-37	962.990	3.1	1.5	1.5	124	260	264	61	78	82	82	5
4	73:49	1652-55	965.497	3.2	1.6	1.6	108	250	259	57	76	81	81	6
5	77:10	1708-12	967.703	3.0	1.5	1.5	106	270	262	58	74	80	80	6
6	80:31	1727-30	969.987	3.1	1.5	1.5	107	263	269	60	75	79	79	6
1	83:44	1737-40	972.076	2.8	1.4	1.4	107	267	267	61	74	79	79	5.5

LEAK ✓
972.076
972.200 .001 @ 10"

$\Delta Vm =$ _____ $\sqrt{\Delta p} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

ΔVm Day 1 = 54.322

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M5-202 | Operator: EZ
Sampling Location: Baghouse Stack2 | Pbar: 30.08 | Ps: -0.86
Run Number: PB-202-2 | Date: 8/1/16 | CO_2: CEM | O_2: CEM
Pretest Leak Rate: 0.001 cfm @ 10 in.Hg. | Beginning of Day 2 | Probe Length/Type: 3'6" | Pitot#: T3-2
Pretest Leak Check: Pitot: ✓ Orsat: – | Stack Diameter: 35.5" | K: 0.5221

Nozzle ID: .2148 | Thermocouple #: T3-2
Assumed Bws: .25 | Filter #: 832594
Meter Box #: 5 | Y: 0993 | ΔH@: 1.996
Post-Test Leak Rate: .001 cfm @ 8 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: –

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	83:44	1020	972.301											
2	87:01	1220-23	974.391	2.7	1.3	1.3	98	295	265	60	75	71	72	5
3	90:27	1235-38	976.497	2.7	1.3	1.3	106	263	266	61	76	71	71	5
4	93:38	1247-51	978.573	2.7	1.3	1.3	119	263	266	61	77	71	71	5
5	96:57	1118-21	980.656	2.6	1.3	1.3	114	261	265	62	78	72	72	5
6	100:18	1130-33	982.766	2.8	1.3	1.3	121	260	264	60	78	72	72	5
1	103:40	1142-45	984.870	2.8	1.3	1.3	120	260	265	61	80	72	72	5
2	107:00	1200-04	987.110	3.4	1.6	1.6	122	263	266	62	80	73	72	6
3	110:21	1214-22	989.329	3.4	1.6	1.6	120	263	265	62	80	74	73	6
4	113:44	1238-42	991.624	3.4	1.6	1.6	123	260	263	63	81	74	74	6
5	116:59	1257-1300	993.832	3.3	1.6	1.6	122	259	265	62	82	75	75	6
6	120:20	1316-19	996.132	3.5	1.7	1.7	125	256	264	63	81	75	75	6.5
1	123:53	1335-39	998.551	3.1	1.5	1.5	118	263	265	63	78	71	71	6
2	127:13	1345-49	1000.824	3.1	1.5	1.5	117	262	265	64	79	72	71	6
	127.32 minutes													

ΔVm = 82.845 $\overline{\sqrt{\Delta p}}$ = 1.7058 $\overline{\Delta H}$ = 1.41 $\overline{Ts}$ = 121 $\overline{Tm}$ = 78

$\overline{\Delta p}$ = 2.9184

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/1/16 Sample Box No. HSB-1
Sample Location Pushing Baghouse
Train Preparer EZ/GD
Sample Recovery Person BF
Comments M5-202

Run No. P-202-2
Job No. 052074.0172
Filter No. 832594
Sample Head No. SH-4
Barometer No. TWC.com
Balance No. FA-2

Front Half
Acetone
Container No. P-202-2 Liquid Level Marked ✓ Sealed ✓

Filter
Container No. 832594 Sealed ✓

Description of Filter Light gray loading

Samples Stored and Locked ✓

Back Half/Moisture
Container No. ~~Rinse~~ 2. Acetone/Hexane ; H_2O

Liquid Level Marked NA Sealed NA

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	MT	—	506.9	610.2	103.3 - 100 = 3.3
2	MT	—	663.7	663.0	-0.3
3	H_2O	100	784.4	788.8	4.4
4	Silica Gel	250	917.2	953.0	35.8
5					
6					
Total					43.2

+100 mL Typical H_2O

Description of Impinger Catch: clear

B_{WS} = 2.4%

I_{SO} 99.7%

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M5-202 | Operator: EZ | Nozzle ID: 0.148 | Thermocouple #: T3-2
Sampling Location: Baghouse Stack 2 | Pbar: 30.20 | Ps: -1.1 | Assumed Bws: 2.5 | Filter #: 832587
Run Number: PB-202-3 | Date: 9/6/16 | CO_2: CEM | O_2: CEM | Meter Box #: 5 | Y: 0.993 | ΔH@: 1.906
Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 3' GL | Pitot#: T3-2 | Post-Test Leak Rate: .001 cfm @ 10 in.Hg. } End of Day 1
Pretest Leak Check: Pitot: ✓ Orsat: – | Stack Diameter: 35.5" | K: 0.5221 | Post-Test Leak Check: Pitot: ✓ Orsat: –

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1026	1.510											
1	3:15	1026-29	3.620	2.9	1.4	1.4	100	260	263	65	80	72	73	3.5
2	6:31	1038-41	5.699	2.7	1.3	1.3	115	264	250	64	81	73	73	3.5
3	9:47	1051-54	7.783	2.9	1.4	1.4	121	262	257	63	80	74	74	3.5
4	13:51	1120-24	10.449	2.9	1.4	1.4	124	258	264	62	84	76	75	3.5
5	17:04	1131-35	12.640	3.4	1.6	1.6	128	260	265	61	83	77	76	4
6	20:20	1145-48	14.882	3.3	1.6	1.6	131	264	265	62	82	78	77	4
1	23:38	1200-04	17.179	3.5	1.7	1.7	130	262	265	63	81	78	78	4.5
2	27:10	1219-23	19.628	3.5	1.7	1.7	128	260	265	65	85	79	79	4.5
3	30:30	1241-45	21.887	3.3	~~1.5~~ 1.6	1.6	133	258	262	61	84	81	80	4
4	33:52	1258-1301	24.345	3.7	1.8	1.8	130	264	267	63	84	82	82	5
5	37:10	1316-20	26.622	3.2	1.5	1.5	132	257	264	63	83	83	82	4.5
6	40:24	1337-41	28.749	3.0	1.4	1.4	139	262	265	63	81	83	83	3.5
1	43:45	1352-55	31.008	3.1	1.5	1.5	145	260	264	65	82	84	83	4
2	47:12	1411-44	33.185	2.5	1.2	1.2	139	257	264	60	83	84	84	3
3	50:22	1455-58	35.165	2.5	1.2	1.2	148	260	266	61	81	84	84	3
4	53:38	1509-12	37.378	3.1	1.5	1.5	140	263	265	62	79	84	84	4
5	57:00	1525-28	39.580	2.8	1.3	1.3	141	259	266	60	77	84	84	3.5
6	60:24	1542-46	41.844	2.7	1.3	1.3	142	262	265	62	79	84	84	3.5
1	63:40	1559-1603	43.992	2.7	1.3	1.3	139	263	265	63	80	84	84	3.5
2	66:57	1616-19	46.152	2.7	1.3	1.3	137	260	264	61	80	84	84	3.5
3	70:15	1633-37	48.364	3.0	1.4	1.4	138	260	266	62	79	84	84	4
4	73:29	1652-55	50.521	2.9	1.4	1.4	137	262	265	60	79	84	84	4
5	76:44	1708-11	52.684	3.0	1.4	1.4	136	259	265	61	79	85	84	4
6	79:53	1724-28	54.767	3.0	1.4	1.4	132	~~263~~ 263	266	62	79	85	84	4
1	83:11	1735-39	56.964	3.0	1.4	1.4	129	263	265	62	78	85	84	4

$\Delta Vm =$ _____ $\overline{\sqrt{\Delta p}} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

ΔVm Day 1 = 55.454

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M5-202 | Operator: EZ
Sampling Location: Baghouse Stack 2 | Pbar: 30.16 | Ps: -1.1
Run Number: PB-202-3 | Date: 9/7/16 | CO_2: CEM | O_2: CEM
Pretest Leak Rate: 0.001 cfm @ 10 in.Hg. (Beginning of Day 2) | Probe Length/Type: 3'GL | Pitot#: T3-2
Pretest Leak Check: Pitot: √ | Orsat: – | Stack Diameter: 35.5" | K: 0.5221

Nozzle ID: 0.148 | Thermocouple #: T3-2
Assumed Bws: 25 | Filter #: 832587
Meter Box #: 5 | Y: 0.993 | ΔH@: 1.906
Post-Test Leak Rate: .001 cfm @ 10 in.Hg.
Post-Test Leak Check: Pitot: √ | Orsat: –

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	83:11	1051	57.224											
2	86:26	1051-54	59.416	3.2	1.6	1.6	107	259	263	65	80	75	74	4
3	89:45	1104-07	61.598	2.9	1.4	1.4	128	264	265	62	80	75	75	4
4	93:01	1116-20	63.704	2.9	1.4	1.4	140	264	266	61	80	76	75	4
5	96:09	1129-32	65.857	3.4	1.6	1.6	150	263	264	60	81	76	76	4.5
6	99:34	1141-44	68.180	3.5	1.6	1.6	150	263	265	61	80	78	77	4
1	102:48	1154-57	70.317	3.1	1.4	1.4	147	263	264	62	80	78	77	4
2	106:04	1506-10	72.485	3.0	1.4	1.4	130	259	263	65	85	84	83	4
3	109:20	1520-24	74.683	3.3	1.6	1.6	134	262	265	65	85	84	84	4
4	112:25	1534-37	76.755	3.2	1.5	1.5	141	263	266	65	81	86	84	4
5	115:40	1547-50	78.958	3.3	1.6	1.6	142	263	266	65	82	86	85	4
6	118:58	1601-04	81.200	3.3	1.6	1.6	145	261	265	64	83	87	86	4
1	122:14	1616-19	83.393	3.2	1.5	1.5	141	262	265	65	83	87	86	4

ΔVm = 81.623 $\overline{\sqrt{\Delta p}}$ = 1.7508 $\overline{\Delta H}$ = 1.47 $\overline{Ts}$ = 134 $\overline{Tm}$ = 81

Δp = 3.0722

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AIC Middletown
Date ~~8/30/16~~ DA 9/7/16 Sample Box No. 17
Sample Location Pushing Baghouse
Train Preparer BF
Sample Recovery Person DA
Comments M5/202

Run No. P-202-3
Job No. 050074.0172
Filter No. 832587
Sample Head No. 1
Barometer No. TWC Con
Balance No. FB-2

Front Half
Acetone Liquid
Container No. P-202-3 Level Marked — Sealed

Filter
Container No. 832587 Sealed ✓

Description of Filter Gray - Very Light

Samples Stored and Locked ✓

Back Half/Moisture
Container No. H2O; Acetone/Hexane

Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	Empty	—	489.2	504.6	15.4
2	Empty	—	676.5	674.7	-1.8
3	DI H2O	100	722.8	729.3	6.5
4	Silica Gel	250	968.2	990.6	22.4
5	Purge H2O	100	100	100	~~-100~~ 0
6					
Total					42.5

Description of Impinger Catch: Clear

EQM C-202-1

FIELD DATA SHEET

Page 1

Plant: AK Steel - Middletown Sample Type: 201A/202 Operator: nh
Sampling Location: Combustion Stack Pbar: 30.20 Ps: 30.824
Run Number: C-PM10-1 Date: 9/6/16 CO_2: 3 3 O_2: 15
Pretest Leak Rate: 0.002 cfm @ 10 in.Hg. Probe Length/Type: 6' G Pitot#: PS-2
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 168" K: ✓

Nozzle ID: 0.342 Thermocouple #: TS-2
Assumed Bws: 10 Filter #: 420923
Meter Box #: 3 Y: 1.009 ΔH@: 1.890
Post-Test Leak Rate: ____ cfm @ ____ in.Hg.
Post-Test Leak Check: Pitot: ____ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1002	822.400											
1	5.25	1007	824.30	0.05	0.462	0.45	350	249	250	68	80	78	77	1
2	10.50	1012	826.30	0.05	0.45	0.45	350	249	250	68	82	77	77	1
3	15.75	1017	828.15	0.05	0.45	0.45	325	247	250	66	83	76	77	1
4	20.50	1022	829.90	0.04	0.45	0.45	349	251	250	63	84	77	76	1
5	25.75	1027	831.80	0.05	0.45	0.46	337	250	250	62	85	77	76	1
6	31.0	1033	833.7	0.05	0.45	0.45	305	247	249	63	80	77	76	1
7	36.25	1036	835.7	0.05	0.45	0.45	319	252	250	60	82	78	77	1
8	41.00	1043	837.5	0.04	0.50	0.50	307	247	249	56	84	79	77	1
9	45.75	1048	839.35	0.04	0.50	0.50	323	251	250	57	81	80	77	2
10	50.50	1053	841.15	0.04	0.50	0.50	339	248	250	56	80	80	78	2
11	55.25	1058	843.05	0.04	0.50	0.50	341	250	251	58	79	80	79	2
12	60.00	1102	844.7	0.04	0.50	0.48	348	251	250	58	79	82	79	2
1	65.25	1107	846.7	0.05	0.50	0.48	361	251	250	59	79	82	78	2
2	70.00	1112	848.5	0.04	0.50	0.48	364	249	250	59	79	83	80	2
3	75.25	1117	850.35	0.05	0.50	0.48	357	249	250	60	80	84	80	2
4	80.50	1123	852.4	0.05	0.50	0.48	369	250	251	61	80	85	81	2
5	85.25	1128	854.3	0.04	0.50	0.48	371	249	250	61	80	86	81	2
6	90.50	1132	856.2	0.05	0.50	0.48	371	248	250	62	81	87	82	2
7	95.75	1137	858.1	0.05	0.50	0.45	365	250	249	62	82	88	83	2
8	101.00	1143	860.07	0.05	0.50	0.48	357	250	250	62	81	87	84	2
9	106.25	1148	862.1	0.05	0.50	0.49	342	251	250	62	82	88	84	2
10	111.50	1153	864.075	0.05	0.50	0.48	353	250	250	63	82	88	85	2
11	116.75	1158	866.05	0.05	0.50	0.48	331	252	252	60	83	89	85	2
12	122.00	12	868.034	0.05	0.50	0.50	332	250	254	61	83	89	85	2

$\Delta Vm =$ _____ $\overline{\sqrt{\Delta p}} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

EQM

FIELD DATA SHEET

page 2 C-PM10-1

Plant: AK Steel
Sampling Location: Combustion Stack
Run Number: C-PM10-1 Date: 9/6/16
Pretest Leak Rate: 0.002 cfm @ 10 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: —

Sample Type: 201A/202 Operator: RK
Pbar: 30.20 Ps: -0.80
CO_2: 3.0 O_2: 15.0
Probe Length/Type: 6' Pitot#: PS-2
Stack Diameter: 168" K: ✓

Nozzle ID: 0.342 Thermocouple #: TS-2
Assumed Bws: 10 Filter #: 470923
Meter Box #: 3 Y: 1.009 ΔH@: 1.880
Post-Test Leak Rate: .002 cfm @ 10 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1205	868.034											
1	5.25	1210	870.1	0.05	0.50	0.50	318	253	252	65	83	89	87	2
2	10.50	1215	872.0	0.05	0.50	0.50	315	252	251	60	83	90	87	2
3	15.75	1220	874.1	0.05	0.53	0.52	300	251	251	57	82	91	87	3
4	20.50	1225	876.0	0.04	0.54	0.53	300	250	251	57	82	91	88	3
5	25.25	1230	877.9	0.04	0.55	0.54	292	251	249	58	81	92	88	3
6	30.50	1235	880.0	0.05	0.55	0.54	305	250	251	60	81	92	88	3
7	35.75	1240	882.1	0.05	0.54	0.54	301	248	251	61	82	94	89	3
8	40.50	1245	883.9	0.04	0.54	0.54	304	248	249	60	81	94	90	3
9	45.25	1250	885.8	0.04	0.54	0.52	307	251	251	61	80	94	90	3
10	50.50	1255	887.7	0.05	0.54	0.50	316	254	249	61	80	94	90	3
11	56.25	1300	~~889.8~~ 890.1	0.06	0.54	0.50	327	254	253	62	81	95	91	3
12	61.75	1306	892.15	0.055	0.54	0.50	318	247	248	62	82	95	91	3
1	67.00	1311	894.25	0.050	0.54	0.52	312	246	249	63	81	95	92	3
2	72.25	1316	896.3	0.050	0.53	0.50	304	252	250	63	81	95	92	4
3	77.50	1321	898.3	0.050	0.54	0.50	295	247	249	64	81	95	92	4
4	82.75	1326	900.3	0.050	0.54	0.50	285	247	251	65	82	95	92	4
5	88.00	1331	902.4	0.050	0.53	0.50	297	248	250	66	83	95	92	4
6	93.25	1338	904.5	0.058	0.55	0.52	301	252	252	60	82	96	92	4
7	98.25	1344	906.3	0.045	0.55	0.52	302	248	252	61	81	96	93	4
8	103.00	1350	908.2	0.040	0.50	0.52	305	251	250	61	80	96	93	5
9	108.25	1354	910.1	0.05	0.5	0.48	331	250	249	61	80	97	93	5
10	113.50	1359	912.0	0.05	0.5	0.48	319	250	249	62	80	97	93	6
11	118.75	1404	914.1	0.05	0.5	0.48	323	249	251	62	81	97	94	6
12	124.00	1409	916.101	0.05	0.5	0.48	325	251	250	63	81	97	94	6

+122.00
246.00

ΔVm = 93.701 $\sqrt{\Delta p}$ = ~~0.2168~~ 0.2176 ΔH = 0.490 Ts = ~~326~~ 327 E2 ✓ E2

Tm = ~~86.8~~ 87 E2

150 = 104.9

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/6/16 Sample Box No. _____
Sample Location Combustion stack
Train Preparer BF
Sample Recovery Person CJ
Comments 202

Run No. C-PM10-1
Job No. 0800740172
Filter No. 470923
Sample Head No. SH-2
Barometer No. twc.com
Balance No. FO-2

Front Half 2.5>PM~~2~~10
Acetone PM<2.5 Liquid
Container No. PM>10 Level Marked ✓ Sealed ✓

Filter
Container No. 470923 Sealed ✓

Description of Filter grey/green loading

Samples Stored and Locked ✓

Back Half/Moisture C-PM10-1
Container No. BACK 1/2 H2O / C-PM10-1 ACE/HEX

Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	Empty	~~40~~ —	507.2	660.4	153.2
2	Empty	—	665.0	663.4	-1.6
3	DI H_2O	100	788.8	790.0	1.2
4	Silica Gel	250	947.4	970.9	23.5
5					
6					
Total					176.3

Description of Impinger Catch: clear

8.3%
Bws

✓ EZ

EQM

FIELD DATA SHEET

Plant: AK Steel
Sampling Location: Combustion Stack
Run Number: C-202-2 Date: 9/7/16
Pretest Leak Rate: 0.002 cfm @ 10 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: —

Sample Type: 2014/202 Operator: RK/BF
Pbar: 30.16 Ps: -0.75
CO_2: 3 O_2: 15
Probe Length/Type: 6' 6" Pitot#: PS-2
Stack Diameter: 168" K: _____

Nozzle ID: 0.342 Thermocouple #: TS-2
Assumed Bws: 10 Filter #: 470 920
Meter Box #: 3 Y: 1.009 ΔH@: 1.89
Post-Test Leak Rate: — cfm @ — in.Hg.
Post-Test Leak Check: Pitot: — Orsat: —

202

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	0835	950.750											
1	4.75	0839	952.3	0.04	~~0.40~~ 0.34	0.35	~~390~~ 357	251	252	68	84	70	70	1
2	9.50	0844	954.1	0.04	0.34	0.35	356	250	251	64	84	71	70	1
3	14.00	0849	955.7	0.035	0.34	0.36	356	249	251	61	84	71	70	1
4	18.50	0854	957.3	0.035	0.34	0.40	358	251	251	57	84	71	70	1
5	23.25	0859	958.95	0.040	0.34	0.45	362	252	250	55	84	73	71	1
6	28.0	0904	960.7	0.040	0.34	0.45	363	251	250	54	83	73	71	1
7	32.75	0908	962.5	0.040	0.34	0.45	365	260	250	55	83	74	71	1
8	37.50	0913	964.3	0.040		0.48	366	247	244	55	81	75	72	1
9	42.00	0918	966.1	0.035		0.48	345	248	246	54	79	76	72	1
10	46.75	0922	967.9	0.040		0.48	350	250	248	54	78	76	73	1
11	51.50	0927	969.7	0.040		0.48	335	253	251	54	77	77	74	1
12	56.25	0932	971.5	0.040		0.48	330	250	249	54	76	78	74	1
1	61.50	0937	973.4	0.050		0.48	317	249	250	54	76	79	75	1
2	66.25	0942	975.2	0.040		0.48	297	249	250	55	76	80	76	1
3	71.00	0947	977.0	0.040		0.48	297	250	250	55	77	81	77	1
4	75.75	0952	978.8	0.040		0.48	350	250	251	56	78	82	77	1
5	80.25	0956	980.45	0.035		0.48	352	249	251	57	78	82	78	1
6	84.75	1000	982.1	0.035		0.48	353	250	251	57	79	82	78	1
7	89.50	1005	983.9	0.040		0.48	358	251	252	57	79	82	78	1
8	94.25	1010	985.8	0.040		0.48	358	251	250	57	79	82	78	1
9	99.00	1015	987.70	0.040		0.48	353	241	251	58	79	82	79	1
10	104.25	1020	989.6	0.050		0.48	336	253	249	58	80	83	79	2
11	109.0	1025	991.50	0.040		0.48	241	252	245	58	80	83	79	2
12	113.75	1030	993.248	0.040		0.48	288	251	248	59	81	83	80	2

ΔVm = _____ $\overline{\sqrt{\Delta p}}$ = _____ $\overline{\Delta H}$ = _____ $\overline{Ts}$ = _____ $\overline{Tm}$ = _____

EQM

FIELD DATA SHEET page 2

Plant: AK Steel Middletown Sample Type: 202A/202 Operator: RK/BC
Sampling Location: Combustion Stack Pbar: 30.16 Ps: -0.25"
Run Number: C-202-2 Date: 9/7/16 CO_2: 3 O_2: 15
Pretest Leak Rate: — cfm @ — in.Hg. Probe Length/Type: 5'6bs Pitot#: PS-2
Pretest Leak Check: Pitot: — Orsat: — Stack Diameter: 168 K:

Nozzle ID: 0.342 Thermocouple #: TS-2
Assumed Bws: 10 Filter #: 470920
Meter Box #: 3 Y: 1.009 ΔH@: 1.820
Post-Test Leak Rate: 0.003 cfm @ 20 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0		1030	993.248											
1	4.75	1034	995.1	0.040		0.48	307	250	251	60	81	84	80	2
2	9.50	1039	996.9	0.040		0.48	266	249	249	62	82	83	80	2
3	14.25	1044	998.6	0.040		0.48	261	250	248	63	83	84	81	2
4	19.50	1049	1000.5	0.050		0.46	304	250	249	58	83	84	81	2
5	24.25	1054	1002.4	0.040		0.46	307	248	251	56	81	85	81	2
6	29.00	1059	1004.2	0.040		0.46	298	246	248	56	81	85	82	2
7	33.75	1104	1006.0	0.040		0.45	292	250	250	57	80	85	82	2
8	38.50	1109	1007.7	0.040		0.45	315	254	251	58	80	86	83	2
9	43.25	1114	1009.45	0.040		0.45	294	247	250	58	79	87	83	2
10	48.00	1119	1011.3	0.040		0.45	293	254	250	59	79	87	83	2
11	53.25	1124	1013.2	0.040		0.45	288	250	249	59	80	87	83	2
12	58.00	1129	1014.7	0.050		0.45	258	248	251	59	80	87	84	2
1	62.00	1134	1016.4	0.040		0.45	288	253	250	59	80	88	84	2
2	67.25	1139	1018.106	0.035		0.45	289	252	251	61	81	87	84	2
*3	72.00	1144	1020.000	0.040		0.45	245	250	251	62	81	87	84	10
*4	76.75	1149	1021.810	0.040		0.45	217	253	250	60	81	87	85	11
5	81.50	1154	—	0.040		0.45	214	251	252	62	81	87	85	20
6		*	Vacuum went to 20+" - could not pull ΔH. Stopped test run											
7	(195.25)													
8	= Total Time													
9														
10														
11														
12														

ΔVm = 71.06 $\overline{\sqrt{\Delta p}}$ = ~~0.2013~~ 0.2004 EZ / ~~0.0405~~ 0.04012 EZ ΔH = ~~0.458~~ 0.457 EZ Ts = ~~309~~ 314 EZ

$\overline{Tm}$ = 80 ✓EZ

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel Middletown — Run No. C-202-2
Date 9/7/16 — Sample Box No. HSB-1 — Job No. 5207.40172
Sample Location Combustion Stack — Filter No. 470920
Train Preparer CJ — Sample Head No. 2
Sample Recovery Person DA — Barometer No. NOAA
Comments Methods 201A/202 — Balance No. 2

Front Half - 3 → 1 min 7 min 2 pass
Acetone Liquid
Container No. C-402-2 Level Marked ____ Sealed ____

Filter
Container No. 470920 Sealed ✓

Description of Filter Black

Samples Stored and Locked ✓

Back Half/Moisture
Container No. 2 H_2O ; Acetone/Hexane

Liquid Level Marked ✓ Sealed —

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	—	—	508.0	632.1	124.1
2	—	—	665.3	663.5	-1.8
3	H_2O	100	790.0	793.6	3.6
4	SG	250	936.9	955.8	18.9
5					
6					
Total			2900.2	3045.0	144.8 ✓ DA

Description of Impinger Catch: Clear

EQM

FIELD DATA SHEET

Plant: AK Steel Middletown Sample Type: 2014/202 Operator: RK/BF
Sampling Location: Combustion Stack Pbar: 30.16 Ps: -0.25
Run Number: C-202-3 Date: 9/7/16 CO_2: 3 O_2: 15
Pretest Leak Rate: 0.005 cfm @ 10 in.Hg. Probe Length/Type: 5' Glass Pitot#: PS-2
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 168" K: —

Nozzle ID: 0.342 Thermocouple #: T5-2
Assumed Bws: 10 Filter #: 470922
Meter Box #: 3 Y: 1.009 ΔH@: 1.89
Post-Test Leak Rate: — cfm @ — in.Hg.
Post-Test Leak Check: Pitot: — Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading (1021.980)	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	1225	~~1027.9~~											
1	4.50	1230	1023.8	0.035	0.50	0.50	331	233	249	68	84	86	85	1
2	9.25	1235	1025.6	0.040	0.5	0.52	304	252	250	68	84	85	86	1
3	14.00	1239	1027.5	0.040	0.5	0.53	322	249	248	59	84	86	85	1
4	18.75	1244	1029.3	0.040	0.5	0.53	308	250	250	57	84	86	86	1
5	23.25	1249	1031.1	0.035	0.5	0.53	325	250	250	56	85	87	86	1
6	28.00	1254	1033.0	0.040	0.5	0.53	333	246	248	56	85	88	86	1
7	32.75	1258	1034.8	0.040	0.5	0.53	332	252	250	56	85	89	86	1
8	37.50	1303	1036.6	0.040	0.5	0.52	326	248	249	57	85	89	86	1
9	42.25	1308	1038.5	0.040	0.5	0.52	339	251	249	58	84	90	87	1
10	46.75	1313	1040.3	0.035	0.5	0.50	333	251	249	58	84	90	87	1
11	51.50	1317	1042.0	0.040	0.5	0.50	319	244	251	59	84	91	87	1
12	56.25	1322	1043.8	0.040	0.5	0.50	322	254	251	59	85	92	88	1
1	60.75	1326	1045.5	0.035	0.5	0.49	320	250	250	59	85	92	88	2
2	65.25	1330	1047.3	0.035	0.5	0.50	309	249	249	60	85	92	88	2
3	70.00	1335	1049.05	0.035	0.5	0.50	317	249	250	57	84	92	89	2
4	74.75	1339	1050.8	0.040	0.5	0.50	322	251	249	53	84	92	89	2
5	79.25	1343	1052.6	0.040	0.5	0.50	324	251	250	53	83	92	89	2
6	83.75	1348	1054.3	0.035	0.5	0.50	319	252	250	55	83	93	90	2
7	88.25	1353	1056.0	0.035	0.5	0.50	331	250	251	55	83	93	90	2
8	93.00	1358	1057.8	0.035	0.5	0.50	318	247	250	57	84	93	90	2
9	97.50	1403	1059.4	0.040	0.5	0.50	337	252	249	58	83	94	90	2
10	102.00	1407	1061.2	0.035	0.5	0.50	326	250	248	58	79	94	90	2
11	106.5	1412	1062.8	0.035	0.5	0.50	344	252	251	58	80	94	91	2
12	111.00	1416	1064.679	0.035	0.5	0.50	337	249	251	59	81	94	91	2

$\Delta Vm = 42.639 \sqrt{\Delta p} = 0.1949$ $\overline{\Delta H} = 0.509$ $\overline{Ts} = 326$ $\overline{Tm} = 89$

0.038

85.202

EQM

FIELD DATA SHEET Page 2

Plant: AK Steel Mansfield Sample Type: 2014/202 Operator: RW/BF
Sampling Location: Combustion Stack Pbar: 30.16 Ps: -0.75
Run Number: C-202-3 Date: 9/7/16 CO_2: 3.0 O_2: 15.0
Pretest Leak Rate: — cfm @ — in.Hg. Probe Length/Type: 5' 6" Pitot#: PS-2
Pretest Leak Check: Pitot: — Orsat: — Stack Diameter: 168" K:

Nozzle ID: 0.342 Thermocouple #: TS-2
Assumed Bws: 10 Filter #: 470922
Meter Box #: 3 Y: 1.009 ΔH@: 1.890
Post-Test Leak Rate: 0.002 cfm @ 10 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1415	1064.619											
1	4.75	1420	1066.5	0.04	0.5	0.5	297	249	250	59	82	95	92	2
2	9.50	1425	1068.3	0.04	0.5	0.5	308	250	251	63	82	94	92	2
3	14.25	1430	1070.1	0.04	0.5	0.5	308	251	249	60	82	94	92	2
4	19.00	1436	1071.95	0.04	0.5	0.5	330	254	251	60	83	94	92	2
5	23.75	1441	1073.7	0.04	0.5	0.5	320	251	249	60	84	95	92	2
6	28.50	1446	1075.6	0.04	0.5	0.5	320	250	251	61	85	95	92	2
7	33.00	1451	1077.3	0.035	0.5	0.5	339	250	251	61	85	95	92	2
8	37.50	1456	1079.0	0.035	0.5	0.5	340	250	250	59	84	95	92	2
9	42.25	1500	1080.9	0.040	0.5	0.5	342	250	248	59	83	95	92	3
10	47.00	1505	1082.6	0.040	0.5	0.5	351	249	252	59	83	95	92	3
11	51.50	1510	1084.4	0.035	0.5	0.5	343	251	251	59	83	95	93	3
12	56.25	1515	1086.2	0.040	0.5	0.5	345	250	251	60	83	96	93	3
1	61.00	1520	1088.0	0.040	0.5	0.5	322	250	247	60	83	95	93	3
2	65.75	1525	1089.9	0.040	0.5	0.5	331	250	252	60	82	96	93	3
3	70.25	1530	1091.5	0.035	0.5	0.5	324	251	249	60	81	96	93	3
4	74.75	1534	1093.2	0.035	0.5	0.5	325	250	252	61	82	96	93	3
5	79.5	1539	1095.1	0.040	0.5	0.5	331	249	251	61	83	96	93	3
6	84.25	1543	1096.9	0.040	0.5	0.5	332	250	251	62	83	97	94	3
7	89.00	1548	1098.7	0.040	0.5	0.5	338	250	250	62	84	98	94	3
8	93.75	1554	1100.5	0.040	0.5	0.5	330	251	249	63	85	98	94	3
9	98.25	1558	1102.3	0.035	0.5	0.5	345	250	250	63	84	97	94	3
10	102.75	1602	1104.0	0.035	0.5	0.5	343	248	250	61	84	97	95	3
11	106.75	1606	1105.5	0.030	0.5	0.5	339	249	247	60	83	97	94	3
12	111.25	1611	1107.18	0.035	0.5	0.5	330	250	252	59	82	97	94	3

$\Delta Vm =$ 42.563 $\sqrt{\Delta p} =$ 0.1744 ~~0.1730~~ 0.0377 EZ $\overline{\Delta H} =$ ~~0.500~~ 0.504 EZ $\overline{Ts} =$ ~~337~~ 328 EZ ✓EZ $\overline{Tm} =$ ~~97~~ 92 EZ

SAMPLE RECOVERY DATA

Plant AK Middletown
Run No. C-202-3
Date 9/7/16
Sample Box No. HSB-3
Job No. 5074-017b
Sample Location Combustion Stack
Filter No. 832609 470 922
Train Preparer EZ/CD
Sample Head No. SH-11
Sample Recovery Person DA
Barometer No. Fluke
Comments ~~AS~~-202 /201A
Balance No. 3

Front Half
$>PM_{10}$ $<PM_{10}$ $<PM_{2.5}$
Acetone 3 Liquid
Container No. C-202-3 Level Marked — Sealed —

Filter
Container No. 470922 Sealed ✓

Description of Filter Blank

Samples Stored and Locked ✓

Back Half/Moisture
Container No. H2O ; Acetone / Hexane

Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	—	—	519.5	718.4	198.9
2	—	—	658.8	658.4	-0.4
3	H_2O		676.4	679.0	2.6
4	Silica Gel	250g	913.7	932.0	18.3
5					
6					
Total					218.4

Description of Impinger Catch: Clear

✓ EZ

HYDROGEN SULFIDE

EQ Environmental Quality Management, Inc.

METHOD 18 SAMPLING DATA

Company: AK STEEL

City: MIDDLETOWN

Date: 8/23/16

Location: COKE BATTERY BAGHOUSE stack 1

Time: 1021-1509

Run No: P-15-1

Meter No: VB-1

Orifice, CC: 19 cc

Barometric Pressure, in.Hg: 29.95

Operator: BF

Ambient Temperature, EF: 85°F

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	25	25	1.00
Post-test			

Sample time, min	Clock time, (24-h) START	Clock time, (24-h) STOP	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF	Vacuum, in.Hg
0.0	1021	1025	7626.88	19 cc	75	25
3.25	1032	1036	7626.95	19 cc	81	25
6.25	1045	1049	7627.02	19 cc	82	25
9.83	1113	1117	7627.13	19 cc	84	25
13.50	1126	1129	7627.29	19 cc	85	25
17.00	1142	1146	7627.38	19 cc	85	25
20.75	1200	1204	7627.48	19 cc	85	25
24.50	1219	1223	7627.53	19cc	85	25
28.25	1239	1243	7627.57	19cc	85	25
31.75	1256	1300	7627.59	19cc	87	25
35.50	1316	1319	7627.61	19cc	88	25
39.25	1334	1337	7627.62	19cc	89	25
43.0	1352	1353	7627.63	19cc	89	25

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

Avg: ~~85°~~ ~~0.750 liters~~

METHOD 18 SAMPLING DATA

Company: AK STEEL City: MIDDLETOWN

Date: 8/23/16 Location: COKE BATTERY BAGHOUSE

Time: 1021- 1509 Run No: P-15-1

Meter No: VB-1 Orifice, CC: 19 cc

Barometric Pressure, in.Hg: 29.95 Operator: BF

Ambient Temperature, EF: 85°F

VACUUM LEAK CHECK DATA

changed to 80cc orifice

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	25	25	1.00
Post-test			

Sample time, min	Clock time, (24-h) START	Clock time, (24-h) STOP	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF	Vacuum, in.Hg
46.25	1442	1446	7627.64	80cc 46cc	89	25
50.50	1452	1456	7627.86	80cc	90	25
54.25	1505	1509	7628.07	80cc	93	25
			7628.33			

$V_{std} = V_m$ liters x Y x 17.647 x $\frac{P_b, in.Hg}{Tm, ^\circ R}$ avg: 86.2°F

1.45 liters

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M15 | Operator: NP/BF | Nozzle ID: — | Thermocouple #: T3-6
Sampling Location: Baghouse 1 | Pbar: 29.95 | Ps: -1.9 | Assumed Bws: 1.5 | Filter #: —
Run Number: P-15-1 | Date: 8-23-16 | CO_2: | O_2: | Meter Box #: 11 | Y: 1.010 | ΔH@: 1.791
Pretest Leak Rate: ___ cfm @ ___ in.Hg. | Probe Length/Type: 3' GL | Pitot#: T3-6 | Post-Test Leak Rate: ___ cfm @ ___ in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: — | Stack Diameter: 35.5" | K: — | Post-Test Leak Check: Pitot: ✓ Orsat: ___

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)	Temp
		1022-1025		3.5			N ~~98~~ 102	260	260	NA	NA	70	70	NA	
		1033-1036		3.5			112	256	255			71	71		
		1045-1049		3.7			117	260	260			72	72		
		1113-1117		4.0			118	259	261			74	73		
		1126-1129		3.7			127	258	258			75	74		
		1142-1146		3.5			127	260	258			75	75		
		1200-1204		3.5			121	257	255			76	76		
		1219-1223		3.3			126	260	260			77	77		
		1239-1243		3.4			126	259	259			78	78		
		1256-1300		3.6			131	259	258			78	78		
		1316-1319		3.2			129	261	260			79	79		
		1334-1337		3.2			127	259	258			~~80~~ 80	~~80~~ 80		
		1352-1355		3.1			~~121~~ 127	259	~~261~~ 260			80	80		104
		1442-1446		3.0			127	258	260			82	82		105
		1452-1456		3.3			126	257	260			82	82		106
		~~1505~~ 1509		3.3			126	260	259			83	82		106
		1522-1525													96
		1540-1543													101
		1557-1601													97
		1614-1618													96
		1653-1656													98
		1707-1710													98
		1722-1726													94

ΔVm = ___ $\sqrt{\Delta p}$ = ~~1.5459~~ 1.8494 ΔH = ___ Ts = 123 Tm = N/A

~~Δp = 3.417~~
3.425 NP

METHOD 18 SAMPLING DATA

Company: AK STEEL

City: MIDDLETOWN

Date: 8/24/2016

Location: COKE BATTERY BAGHOUSE

Time: 1027 - 1509

Run No: P-15-2

Meter No: VB-1

Orifice, CC: 19cc

Barometric Pressure, in.Hg: 29.97

Operator: BF

Ambient Temperature, EF: 85°F

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	25	25	1.00
Post-test			

Sample time, min	START Clock time, (24-h)	STOP time, (24-h)	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF	Vacuum, in.Hg
0	1027	1031	7628.54	19cc	76	25
3.75	1040	1044	7628.65	19cc	77	25
7.50	1054	1058	7628.75	19cc	77	25
11.00	1107	1111	7628.84	19cc	78	25
14.50	1124	1128	7628.95	19cc	77	25
18.25	1139	1142	7629.07	19cc	80	25
21.75	1158	1201	7629.21	19cc	81	25
25.50	1217	1221	7629.33	19cc	83	25
29.10	1236	1240	7629.37	19cc	85	25
32.75	1255	1259	7629.41	19cc	87	25
36.50	1314	1318	7629.43	19cc	89	25
40.25	1333	1336	7629.45	19cc	91	25
44.00	1350	1354	7629.47	19cc	92	25

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

METHOD 18 SAMPLING DATA

Company: AK STEEL City: MIDDLETOWN

Date: 8/25/16 Location: COKE BATTERY BAGHOUSE

Time: 1027-1509 Run No: P-15-2

Meter No: VB-1 Orifice, CC: 19

Barometric Pressure, in.Hg: 29.97 Operator: BF

Ambient Temperature, EF: 85°F

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test			
Post-test			

Sample time, min	START Clock time, (24-h)	STOP	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF	Vacuum, in.Hg
48.0	1438	1442	7629.72	19cc	91	25
51.75	1453	1459	7629.98	19cc	92	25
55.25	1506	1509	7630.13	19cc	91	25
59.00			7630.35	19cc	92	25

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

avg = 84.8 °F

V_m = 1.81 liters

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M15 | Operator: NP/BF | Nozzle ID: — | Thermocouple #: TJ-6

Sampling Location: P. Baghouse #1 | Pbar: 29.97 | Ps: -1.5 | Assumed Bws: 1.5 | Filter #: —

Run Number: P-15-7 | Date: 8-24-16 | CO_2: — | O_2: — | Meter Box #: 11 | Y: 1.010 | ΔH@: 1.791

Pretest Leak Rate: — cfm @ — in.Hg. | Probe Length/Type: 3' GL | Pitot#: T3-6 | Post-Test Leak Rate: — cfm @ — in.Hg.

Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: — | Post-Test Leak Check: Pitot: — | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)	Temp
		1027-1031		3.7			105	259	260	NA	NA	74	74	NA	91
		1040-1044		3.5			118	262	261			76	75		87
		1054-1058		3.5			115	260	261			75	74		90
		1107-1111		3.7			117	260	260			77	76		89
		1124-1128		3.5			118	264	260			78	77		84
		1139-1142		3.5			119	262	261			78	78		93
		1158-1201		3.6			117	262	261			79	78		
		1217-1221		3.4			116	263	261			79	78		
		1236-1240		3.6			117	260	260			79	79		
		1255-1259		3.5			118	260	260			79	79		
		1314-1318		3.3			120	257	261			80	79		
		1333-1336		3.4			121	267	265			81	80		
		1350-1354		3.3			121	267	264			81	81		
		1438-1442		3.4			116	257	258			82	82		100
		1455-1459		3.4			116	258	261			83	83		102
		1500-1509		3.4			125	259	261			83	83		100
								256	260			83	83		

ΔVm = — $\overline{\sqrt{\Delta p}}$ = 1.8655 $\overline{\Delta H}$ = — $\overline{Ts}$ = 117 $\overline{Tm}$ = —

Δp = 3.48

NP

METHOD 18 SAMPLING DATA

Company: AK STEEL City: MIDDLETOWN Stack

Date: 8/25/2016 Location: COLE BATTERY BAGHOUSE

Time: 1028 - 1509 Run No: P-15-3

Meter No: VB-1 Orifice, CC: 19

Barometric Pressure, in.Hg: 30.30 Operator: BF

Ambient Temperature, EF: 90°F

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	25	25	1.00
Post-test			

Sample time, min	Start Clock time, (24-h)	Stop time,	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF	Vacuum, in.Hg
0.0	1028	1031	7633.20	19 cc	83	25
3.75	1042	1046	7633.32	19 cc	83	25
7.50	1054	1058	7633.39	19cc	84	25
11.25	1123	1126	7633.42	19 cc	85	25
15.00	1134	1137	7633.44	19cc	86	25
18.75	1145	1149	7633.52	19cc	87	25
22.50	1159	1203	7633.59	19cc	90	25
26.75	1218	1222	7633.67	19cc	92	25
30.00	1238	1241	7633.72	19cc	92	25
33.75	1257	1300	7633.78	19cc	93	25
37.50	1316	1319	7634.16	19cc	94	25
41.25	1335	1338	7634.50	19cc	96	25
45.00	1350	1354	7634.71	19cc	96	25

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

METHOD 18 SAMPLING DATA

Company: AK STEEL City: MIDDLETOWN

Date: 8/25/2016 Location: COKE BATTERY BAGHOUSE

Time: 1028 - 1509 Run No: P-15-3

Meter No: V8-1 Orifice, CC: 19

Barometric Pressure, in.Hg: 30.30 Operator: BF

Ambient Temperature, EF: 90°F

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test			
Post-test			

Sample time, min	Clock time, (24-h) START	Clock time, (24-h) STOP	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF	Vacuum, in.Hg
48.75	1435	1439	7634.94	19cc	98	25
52.50	1445	1452	7635.19	19cc	100	25
56.25	1506	1509	7635.40	19cc	100	25
59.75			7635.50	19cc	100	25
			2.30 liters		avg = 91.7°F	

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M-15 | Operator: NP/BF | Nozzle ID: — | Thermocouple #: T3-6

Sampling Location: P. Baghouse 1 | Pbar: 30.30 | Ps: -.80 | Assumed Bws: .15 | Filter #:

Run Number: P-15-3 | Date: 8-25-16 | CO_2: | O_2: | Meter Box #: 11 | Y: 1.010 | ΔH@: 1.791

Pretest Leak Rate: ___ cfm @ ___ in.Hg. | Probe Length/Type: 3' GL | Pitot#: T3-6 | Post-Test Leak Rate: ___ cfm @ ___ in.Hg.

Pretest Leak Check: Pitot: ✓ Orsat: — | Stack Diameter: 35.5" | K: — | Post-Test Leak Check: Pitot: Orsat:

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
		1038 - 1031		2.9	NA	NA	102	262	263	NA	NA	83	83	NA
		1042 - 1046		2.9			107	264	266			82	82	
		1054 - 1058		2.7			116	263	268			82	82	
		1123 - 1126		2.6			125	266	268			82	82	
		1134 - 1137		2.5			130	266	269			83	82	
		1145 - 1149		2.7			131	262	263			83	82	
		1159 - 1203		3.0			126	266	267			83	83	
		1218 - 1222		2.5			120	263	263			84	83	
		1238 - 1241		2.6			128	262	264			84	84	
		1257 - 1300		2.8			130	263	264			85	84	
		1316 - 1319		2.9			129	264	263			85	85	
		1335 - 1338		2.6			130	266	265			86	86	
		1350 - 1354		2.6			125	260	262			86	86	
		1435 - 1439		2.8			126	260	258			89	89	
		1449 - 1452		2.6			128	264	264			89	89	
		1506 - 1510		2.6			132	262	263			89	89	

A

ΔVm = ___ $\overline{\sqrt{\Delta p}}$ = 2.8436 $\overline{\Delta H}$ = ___ $\overline{Ts}$ = 124 $\overline{Tm}$ = 85

Ave DP = 1.6489

DS

NP

METHOD 18 SAMPLING DATA

Company: AK STEEL City: MIDDLETOWN

Date: 8-29-2016 Location: COMBUSTION STACK

Time: 1024-1124 Run No: C-15-1

Meter No: VB-2 Orifice, CC: 15

Barometric Pressure, in.Hg: 30.11 Operator: BF

Ambient Temperature, EF: 90°F

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	25	25	1.00
Post-test			

Sample time, min	Clock time, (24-h)	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF	Vacuum, in.Hg
0	1024	4432.86	15 cc	87	25
5	1029	4432.94		91	
10	1034	4433.02		93	
15	1039	4433.10		94	
20	1044	4433.18		96	
25	1049	4433.26		97	
30	1054	4433.34		98	
35	1059	4433.42		99	
40	1104	4433.50		100	
45	1109	4433.58		101	
50	1114	4433.66		102	
55	1119	4433.74		103	
60	1124	4433.85		103	

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm,^\circ R}$$ 0.99C $\overline{Tm} = 97$

EQM

FIELD DATA SHEET

Plant: AK 1 | Sample Type: MOISTURE | Operator: DS/BF | Nozzle ID: — | Thermocouple #: —

Sampling Location: Combustion | Pbar: 30.11 | Ps: -0.85 | Assumed Bws: — | Filter #: —

Run Number: M-1 | Date: 8/29/2016 | CO_2: 3 | O_2: 15 | Meter Box #: 2 | Y: 1.005 | ΔH@: 1.687

Pretest Leak Rate: 0.002 cfm @ 10 in.Hg. | Probe Length/Type: 7' GLASS | Pitot#: — | Post-Test Leak Rate: 0.002 cfm @ 5 in.Hg.

Pretest Leak Check: Pitot: ✓ Orsat: | Stack Diameter: 168" | K: — | Post-Test Leak Check: Pitot: ✓ Orsat: ✓

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
	0	1024	676.690											
1	5	1029	679.5	0.04	1.5	1.5	357	—	—	51	—	75	72	0
2	10	1034	683.7	0.04	1.5	1.5	350	—	—	54	—	77	72	0
3	15	1039	687.1	0.05	1.5	1.5	352	—	—	55	—	78	73	0
4	20	1044	690.4	0.05	1.5	1.5	350	—	—	57	—	80	73	0
5	25	1049	693.9	0.06	1.5	1.5	350	—	—	58	—	83	74	0
6	30	1054	697.3	0.06	1.5	1.5	350	—	—	56	—	85	75	0
1	35	1059	700.7	0.05	1.5	1.5	232	—	—	55	—	86	77	0
2	40	1104	704.2	0.05	1.5	1.5	240	—	—	57	—	88	78	0
3	45	1109	707.7	0.05	1.5	1.5	258	—	—	59	—	88	78	0
4				0.05			250							
5				0.06			250							
6				0.03			254							
1				0.04			240							
2				0.04			240							
3				0.05			225							
4				0.06			225							
5				0.05			230							
6				0.05			225							
1				0.02			250							
2				0.02			257							
3				0.04			258							
4				0.04			257							
5				0.05			250							
6				0.05			244							
							243							

ΔVm = 31.01 | $\overline{\sqrt{\Delta p}}$ = 0.2123 | $\overline{\Delta H}$ = 1.5 | $\overline{Ts}$ = 270 | $\overline{Tm}$ = 78

$\overline{\Delta p}$ 0.046

✓ BF

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 8/29/16 Sample Box No. _____
Sample Location Combustion Stack
Train Preparer CJ
Sample Recovery Person CJ
Comments M4

Run No. C-15-1
Job No. 050074.0172
Filter No. —
Sample Head No. 6
Barometer No. TWC.Com
Balance No. 2

Front Half
Acetone
Container No. N/A Liquid Level Marked _____ Sealed _____

Filter
Container No. _____ Sealed _____

Description of Filter _____

Samples Stored and Locked _____

Back Half/Moisture
Container No. N/A

Liquid Level Marked _____ Sealed _____

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H_2O	100	802.2	854.6	52.4
2	H_2O	100	784.7	787.9	3.2
3	—	—	669.5	670.0	0.5
4	SG	250	942.1	958.1	16.0
5					
6					
Total					72.1

$\sqrt{B_f}$

Description of Impinger Catch: grey

$B_{ws} = 9.9\%$

METHOD 18 SAMPLING DATA

Company: AK STEEL City: MIDDLETOWN

Date: 8/29/2016 Location: COMBUSTION STACK

Time: 1135 - 1235 Run No: C-15-2

Meter No: VB-2 Orifice, CC: 15 in

Barometric Pressure, in.Hg: 30.11 Operator: BF

Ambient Temperature, EF: 90 °F

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	25	25	1.00
Post-test			

Sample time, min	Clock time, (24-h)	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF	Vacuum, in.Hg
0	1135	4433.87	15 in	104	25
5	1140	4433.96		105	
10	1145	4434.08		105	
15	1150	4434.17		106	
20	1155	4434.28		106	
25	1200	4434.40		107	
30	1205	4434.49		107	
35	1210	4434.58		107	
40	1215	4434.69		107	
45	1220	4434.82		107	
50	1225	4434.93		107	
55	1230	4435.10		107	
60	1235	4435.21		107	

1.34 L

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$ $\bar{T}_M = 106$

EQM

FIELD DATA SHEET

Plant: AK | Sample Type: MOISTURE | Operator: DS/BF | Nozzle ID: — | Thermocouple #: ____

Sampling Location: COMBUSTION | Pbar: 30.11 | Ps: -0.82 | Assumed Bws: ____ | Filter #: ____

CS-2 Run Number: M-2 | Date: 8/29/2016 | CO_2: ____ | O_2: ____ | Meter Box #: 2 | Y: 1.005 | ΔH@: 1.687

Pretest Leak Rate: 0.000 cfm @ 5 in.Hg. | Probe Length/Type: 7' 6/6" | Pitot#: ____ | Post-Test Leak Rate: 0.001 cfm @ 5 in.Hg.

Pretest Leak Check: Pitot: ✓/✓ Orsat: ____ | Stack Diameter: 168" | K: ____ | Post-Test Leak Check: Pitot: ✓/✓ Orsat: ____

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
	0	1135	707.88											
1	5	1140	711.3	0.04	1.5	1.5	269	—	—	63	~~78~~	83	81	1
2	10	1145	714.7	0.04	1.5	1.5	287	—	—	64	—	87	82	1
3	15	1150	718.2	0.04	1.5	1.5	291	—	—	60	—	88	82	2
4	20	1155	721.6	0.04	1.5	1.5	285	—	—	60	—	88	82	2
5	26	1200	725.0	0.05	1.5	1.5	280	—	—	57	—	89	82	2
6	30	1205	728.4	0.05	1.5	1.5	271	—	—	55	—	90	83	3
1	35	1210	731.8	0.03	1.5	1.5	251	—	—	55	—	92	83	3
2	40	1215	735.1	0.03	1.5	1.5	250	—	—	54	—	93	84	3
3	45	1220	738.66	0.04	1.5	1.5	249	—	—	54	—	94	85	3
4				0.05			248							
5				0.06			247							
6				0.06			246							
1				0.03			245							
2				0.04			240							
3				0.04			238							
4				0.04			237							
5				0.05			230							
6				0.03			313							
1				0.03			310							
2				0.03			309							
3				0.03			308							
4				0.04			307							
5				0.04			306							
6				0.04			305							

ΔVm = 30.18 | $\overline{\sqrt{\Delta p}}$ = 0.1998 BF 0.207 | $\overline{\Delta H}$ = 1.5 | $\overline{Ts}$ = 272 | $\overline{Tm}$ = 86

~~0.045~~ .0404

√BF

EQ Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown 8 Run No. C-15-2
Date 8/29/16 Sample Box No. 8 Job No. 050074.0172
Sample Location Combustion Stack Filter No. —
Train Preparer NP Sample Head No. 7
Sample Recovery Person CJ Barometer No. THC.com
Comments _____ Balance No. 2

Front Half
Acetone Liquid
Container No. N/A Level Marked _____ Sealed _____

Filter
Container No. _____ Sealed _____

Description of Filter _____

Samples Stored and Locked _____

Back Half/Moisture
Container No. N/A

Liquid Level Marked _____ Sealed _____

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H2O	100	758.8	814.8	56.0
2	H2O	100	766.3	772.2	5.9
3	—	—	661.8	664.0	2.2
4	SG	250	939.5	946.2	6.7
5					
6					
Total					70.8

Description of Impinger Catch: grey

9.9% VOF

METHOD 18 SAMPLING DATA

Company: AK STEEL City: MIDDLETOWN

Date: 8/29/2016 Location: COMBUSTION STACK

Time: 1245 - 1345 Run No: C-15-3

Meter No: V13-2 Orifice, CC: 15

Barometric Pressure, in.Hg: 30.11 Operator: BF

Ambient Temperature, EF: 90°F

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	25	25	1.00
Post-test			

Sample time, min	Clock time, (24-h)	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF	Vacuum, in.Hg
0	1245	4435.26	15	106	25
5	1250	4435.35		106	
10	1255	4435.43		105	
15	1300	4435.52		105	
20	1305	4435.61		106	
25	1310	4435.72		105	
30	1315	4435.80		105	
35	1320	4435.90		105	
40	1325	4436.02		104	
45	1330	4436.14		105	
50	1335	4436.22		105	
55	1340	4436.30		105	
60	1345	4436.41		105	

$V_m = 1.15L$ $\overline{T_M} = 105$

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

EQM

FIELD DATA SHEET

Plant: AK | Sample Type: MOISTURE | Operator: DS/BF | Nozzle ID: — | Thermocouple #: ____

Sampling Location: COMBUSTION | Pbar: 30.11 | Ps: -0.85 | Assumed Bws: ____ | Filter #: —

C-15-3 Run Number: M-3 | Date: 8/29/2016 | CO_2: ____ | O_2: ____ | Meter Box #: 2 | Y: 1.005 | ΔH@: 1.687

Pretest Leak Rate: 0.000 cfm @ 8 in.Hg. | Probe Length/Type: 7'6/SS | Pitot#: ____ | Post-Test Leak Rate: ____ cfm @ ____ in.Hg.

Pretest Leak Check: Pitot: ✓ Orsat: — | Stack Diameter: 168" | K: ____ | Post-Test Leak Check: Pitot: ✓ Orsat: ____

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
	0	1245	738.85											
1	5	1250	742.3	0.02	1.5	1.5	311	—	—	57	—	89	87	1
2	10	1255	745.7	0.03	1.5	1.5	312	—	—	58	—	90	87	1
3	15	1300	749.1	0.03	1.5	1.5	310	—	—	59	—	92	88	1
4	20	1305	752.5	0.04	1.5	1.5	308	—	—	60	—	94	88	1
5	25	1310	756.0	0.05	1.5	1.5	307	—	—	60	—	96	88	1
6	30	1315	759.5	0.06	1.5	1.5	306	—	—	61	—	98	90	1
1	35	1320	762.9	0.03	1.5	1.5	279	—	—	61	—	99	90	1
2	40	1325	766.4	0.03	1.5	1.5	277	—	—	62	—	100	91	1
3	45	1330	769.91	0.04	1.5	1.5	275	—	—	62	—	100	91	1
4	~~8~~			0.04			273							
5				0.05			272							
6				0.04			271							
1				0.03			260							
2				0.03			259							
3				0.03			269							
4				0.04			268							
5				0.04			263							
6				0.05			260							
1				0.05			263							
2				0.04			262							
3				0.04			260							
4				0.05			258							
5				0.05			253							
6				0.06			251							

ΔVm = 31.06 | $\overline{\sqrt{\Delta p}}$ = 0.206 | $\overline{\Delta H}$ = 1.5 | $\overline{Ts}$ = 276 | $\overline{Tm}$ = 92

$\overline{0.04}$

✓BF

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 8/29/16 Sample Box No. _____
Sample Location Combustion Stack
Train Preparer CJ
Sample Recovery Person CJ
Comments M4

Run No. C-15-3
Job No. 050074.0172
Filter No. —
Sample Head No. 4
Barometer No. TWC.com
Balance No. 2

Front Half
Acetone
Container No. N/A Liquid Level Marked _____ Sealed _____

Filter
Container No. _____ Sealed _____

Description of Filter _____

Samples Stored and Locked _____

Back Half/Moisture
Container No. N/A

Liquid Level Marked _____ Sealed _____

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H_2O	100	813.9	880.7	66.8
2	H_2O	100	782.5	789.1	6.6
3	—	—	669.9	671.3	1.4
4	SG	~~250~~ 150	947.6	954.7	7.1
5					
6					
Total					81.9

Description of Impinger Catch: grey

$B_{WS} = 11.3\%$

VBF

SULFUR DIOXIDE AND CARBON MONOXIDE

Averages
O_2 20.656
CO_2 0.456
CO ~~30.65~~ 30.65
SO_2 5.67

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK Steel
Location: Pooling Baghouse
Project No.: 50074.0172

Operator: Doug Allen
Date: 8/23/16

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time: 0855		Time: 1205 - 1212			Time: 1508 - 1515			Time:			
O_2	Zero	0	0.182	0.176	0.23			0.204						
	Low	–	–	–										
	Mid	11.02	11.138	11.065										CC443456
	High	21.89	22.069	21.837	21.85			21.823						CC443447
CO_2	Zero	0	0.162	0.246	0.18			0.164						
	Low	–	–	–										
	Mid	11.23	11.308	11.077	11.10			11.041						CC443447
	High	21.94	22.169	21.994										CC443456
CO	Zero	0	-1.08	0.33	-0.8			-2.94						
	Low	–	–	–										
	Mid	190.9	189.61	185.50	184.8			182.47						CC73578
	High	454.8	456.54	447.56										CC73679
SO_2	Zero	0	0.14	0.55	0.56			0.34						
	Low	–	–	–										
	Mid	44.88	44.38	44.93	43.9			43.78						CC66198
	High	89.09	88.12	89.28			Stop ~~Purge~~							SG9134953BAL
Heat Trace Averages	Purge	Start	Stop		Purge	Start		Purge	Start	Stop	Purge	Start	Stop	
	1	1022	1025		5	1126	1129	9	1239	1243	13	1352	1355	
	2	1033	1037		6	1143	1146	10	1256	1300	14	1442	1446	
	3	1046	1049		7	1200	1204	11	1316	1320	15	1452	1456	
	4	1113	1117		8	1219	1223	12	1334	1337	16	1505	1509	

1 minute Response Time

Averages
O_2 20.628
CO_2 0.420
CO 21.87
SO_2 4.45

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK Steel
Location: Rushing Baghouse
Project No.: 050074-0172

Operator: Doug Allen
Date: 8/24/16

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time:		Time:	1128- ~~1150~~		Time:	1509		Time:			
O_2	Zero	0	0.234	0.180	0.26			0.204						
	Low	—												
	Mid	11.02	11.113	10.986										
	High	21.89	21.984	21.783	21.78			21.729						
CO_2	Zero	0	0.233	0.193	0.15			0.209						
	Low	~~11~~												
	Mid	11.23	11.101	11.077	11.0			10.968						
	High	21.94	22.051	21.829										
CO	Zero	0	-0.04	1.01	0.55			-1.20						
	Low	—												
	Mid	190.9	189.74	186.87	186.1			183.75						
	High	454.0	455.81	448.62										
SO_2	Zero	0	-0.44	0.81	0.9			1.26						
	Low	—												
	Mid	44.88	43.25	44.97	44.4			44.04						
	High	89.09	89.26	87.50										
Push ~~Purge~~ Times ~~Averages~~		Peak	Start	Stop		Peak	Start	Stop		Peak	Start	Stop	Peak	Start	Stop
	1	1027	1031			5	1124	1128		9	1236	1240	13	1350	1354
	2	1040	1044			6	1139	1142		10	1255	1259	14	1438	1442
	3	1054	1054			7	1154	1201		11	1314	1318	15	1455	1459
	4	1107	1111			8	1217	1221		12	1333	1337	16	1506	

Averages
O_2 20.491
CO_2 0.463
CO 22.05
SO_2 6.51

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: Ak steel
Location: Pushing Baghouse
Project No.: 050074.0172

Operator: Doug Allen
Date: 8/25/16

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time: 0834		Time: 1223			Time: 1570			Time:			
O_2	Zero	0	0.193	0.233	0.23			0.195						
	Low	–	–	–										
	Mid	11.02	11.021	10.992										
	High	21.89	21.899	21.731	21.62			21.629						
CO_2	Zero	0	0.245	0.241	0.25			0.180						
	Low	–	–	–										
	Mid	11.23	11.046	11.030	10.9			10.873						
	High	21.94	21.894	21.766										
CO	Zero	0	-0.25	-0.78	-2.1			-3.87						
	Low	–	–	–										
	Mid	190.9	186.80	184.33	184.1			179.14						
	High	454.8	454.97	447.69										
SO_2	Zero	0	-0.28	0.06	0.3			0.99						
	Low	–	–	–										
	Mid	44.88	45.06	45.14	44.6			43.86						
	High	89.09	90.17	88.35										
~~Heat~~ Push Times	~~Heat~~ Push	Start	Stop		~~Heat~~ Push	Start	Stop	~~Heat~~ Push	Start	Stop	~~Heat~~ Push	Start	Stop	
Averages	1	1028	1031		5	1134	1137	9	1238	1241	13	1350	1354	
	2	1042	1046		6	1145	1149	10	1257	1300	14	1435	1439	
	3	1054	1058		7	1159	1203	11	1318	1319	15	1449	1452	
	4	1123	1126		8	1218	1222	12	1335	1338	16	1506	1509	

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK Steel Middletown
Location: Combustion Stack
Project No.: 0074-0172

Operator: Allen
Date: 8/29/16

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time: 0845		Time: 1024 - 1124			Time: 1135 - 1235			Time: 1245 - 1345			
O_2	Zero	0	0.193	0.294	0.285			0.233			0.253			
	Low	–	—	—										
	Mid	11.02	11.125	11.113										
	High	21.89	22.036	21.827	21.669			21.600			21.744			
CO_2	Zero	0	0.188	0.182	0.167			0.134			0.163			
	Low	–	—	—										
	Mid	11.23	11.070	11.052	10.813			10.773			10.940			
	High	21.94	22.034	21.756										
CO	Zero	0	0.92	0.19	0.17			1.08			0.99			
	Low	–	—	—										
	Mid	190.9	188.96	186.74	186.73			186.31			186.18			
	High	454.8	457.44	449.10										
SO_2	Zero	0	0.56	0.66	0.79			0.55			0.65			
	Low	–	–	—										
	Mid	189.4	191.84	191.55	188.26			191.56			195.52			
	High	453.7	456.88	449.96										
Averages														
				O_2	15.175			15.643			15.158			
				CO_2	2.994			2.738			2.961			
				CO	55.07			63.79			85.19			
				SO_2	254.01			230.40			230.30			

SPECIATED VOLATILE ORGANIC HAP (VOHAP)

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M316 | Operator: NP

Sampling Location: Baghouse 1 | Pbar: 30.23 | Ps: -1.1

Run Number: P-316-1 | Date: 8-30-16 | CO_2: 0.3 | O_2: 20.5

Pretest Leak Rate: .001 cfm @ 8 in.Hg. | Probe Length/Type: 3' GL | Pitot#: T3-6

Pretest Leak Check: Pitot: ✓ Orsat: — | Stack Diameter: 35.5" | K: .5562

Nozzle ID: .152 | Thermocouple #: T3-6

Assumed Bws: 1.5 | Filter #: ——

Meter Box #: 11 | Y: 1.010 | ΔH@: 1.791

Post-Test Leak Rate: .001 cfm @ 10 in.Hg.

Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1026	497.493											
1	3:28	1026-1029	500.051	3.4	1.8	1.8	100	264	264	65	NA	70	70	3
2	6:59	1043-1046	502.773	3.5	1.8	1.8	105	251	265	65		73	73	3
3	10:28	1119-1122	505.060	3.6	1.9	1.9	106	266	266	64		74	74	3
4	13:55	1139-1142	507.615	3.5	1.8	1.8	110	260	267	64		76	76	3
5	17:25	1201-1204	510.252	3.7	1.9	1.9	112	261	269	63		78	77	3
6	20:52	1211-1214	512.850	3.8	2.0	2.0	115	252	262	63		79	79	3
1	24:26	1221-1224	515.598	3.8	2.0	2.0	116	263	267	63		80	79	3
2	27:37	1231-1234	518.073	3.9	2.0	2.0	118	255	265	62		81	80	3
3	31:09	1245-1248	520.851	3.8	2.0	2.0	120	264	265	62		81	81	3
4	34:43	1258-1302	523.616	3.6	1.9	1.9	121	262	265	62		83	81	3
5	38:18	1316-1319	526.515	3.7	1.9	1.9	122	266	265	63		83	83	3
6	41:53	1335-1338	529.357	3.7	1.9	1.9	125	255	260	62		84	84	3
1	45:31	1345-1347	530.615	3.7	1.9	1.9	126	265	264	62		85	85	3
2	47:00	1348-1351	533.322	3.7	1.9	1.9	127	261	262	62		86	85	3
3	50:22	1442-1445	535.976	3.6	1.9	1.9	127	263	267	63		87	86	3
4	53:58	1458-1501	538.865	3.5	1.8	1.8	125	265	266	63		87	87	3
5														
6														
1														
2														
3														
4														
5														
6														

ΔVm = 41.372 $\sqrt{\Delta p}$ = 1.918 $\overline{\Delta H}$ = 1.9 $\overline{Ts}$ = 117 $\overline{Tm}$ = 80

Ave DP = 3.6563

VBF

SAMPLE RECOVERY DATA

Plant AK MIDDLETOWN
Run No. P-316-1
Date 8/30/16
Sample Box No. _____
Job No. 050074.0172
Sample Location Pushing Baghouse
Filter No. NA
Train Preparer CJ
Sample Head No. 5
Sample Recovery Person BF
Barometer No. TWC. com
Comments 316
Balance No. FB-2

Front Half
Acetone P-316-1 Liquid
Container No. ~~NA~~ 361 Level Marked ~ Sealed ✓

Filter
Container No. NA Sealed NA

Description of Filter NA

Samples Stored and Locked ✓

Back Half/Moisture
Container No. NA

Liquid Level Marked NA Sealed NA

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	TYPE I H_2O	100	789.1	794.8	5.7 ✓
2	TYPE I H_2O	100	761.9	763.7	1.8 ✓
3	—	—	652.1	653.6	1.5 ✓
4	SG	250	918.9	927.6	8.7 ✓
5					
6					
Total					17.7 ✓

Description of Impinger Catch: clear

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M316 | Operator: NP | Nozzle ID: .152 | Thermocouple #: T3-6
Sampling Location: @ Baghouse 1 | Pbar: 30.05 | Ps: -1.1 | Assumed Bws: 1.5 | Filter #: —
Run Number: P-316-2 | Date: 8-31-16 | CO_2: CEM | O_2: CEM | Meter Box #: 11 | Y: 1.010 | ΔH@: 1.791
Pretest Leak Rate: 0.001 cfm @ 10 in.Hg. | Probe Length/Type: 3'GL | Pitot#: T3-6 | Post-Test Leak Rate: 0.001 cfm @ 3 in.Hg.
Pretest Leak Check: Pitot: √± | Orsat: — | Stack Diameter: 36.6" | K: .5562 | Post-Test Leak Check: Pitot: √± | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1020	539.343											
1	3:26	1020-1024	541.984	3.9	2.1	2.1	96	264	260	65	NA	70	70	3
2	6:59	1035-1039	544.760	3.9	2.1	2.1	100	261	265	65		73	73	3
3	10:27	1049-1052	547.393	3.8	2.0	2.0	102	258	261	64		74	73	3
4	13:56	1104-1107	550.133	3.8	2.0	2.0	105	264	262	64		75	75	3
5	17:26	1123-1126	552.875	3.7	1.9	1.9	108	264	262	63		76	75	3
6	21:04	1141-1145	555.619	3.6	1.9	1.9	110	261	260	63		77	76	3
1	24:36	1200-1204	558.305	3.8	2.0	2.0	115	263	264	63		78	77	3
2	28:10	1220-1224	561.087	3.8	2.0	2.0	120	263	263	62		80	78	3
3	31:44	1239-1243	563.897	3.9	2.0	2.0	123	260	263	62		81	80	3
4	35:16	1257-1301	566.660	3.7	1.9	1.9	125	262	263	62		82	81	3
5	38:47	1316-1320	569.443	3.7	1.9	1.9	120	262	263	61		83	83	3
6	42:20	1335-1339	572.246	3.7	1.9	1.9	122	264	264	61		83	83	3
1	45:52	1345-1349	575.037	3.7	1.9	1.9	121	264	263	62		84	84	3
2	49:26	1446-1452	577.849	3.7	1.9	1.9	121	263	264	60		85	85	3
3	52:49	1459-1503	580.545	3.6	1.9	1.9	123	263	263	60		86	85	3
4							126	264	263	60		86	86	3
5	52.82 minutes													
6														
1														
2														
3														
4														
5														
6														

ΔVm = 41.202 ✓ $\sqrt{\Delta p}$ = 1.9372 ✓ ΔH = 1.96 $\overline{Ts}$ = 114.1 ✓ $\overline{Tm}$ = 79 ✓ MK

Ave ΔP = 3.7533

SAMPLE RECOVERY DATA

Plant AK steel Middletown
Run No. P-316-2
Date 8/31/16
Sample Box No. SB-7
Job No. 50074.0172
Sample Location Pushing Baghouse
Filter No. NA
Train Preparer CJ
Sample Head No. SH-3
Sample Recovery Person DA
Barometer No. WC.co
Comments 316
Balance No. 2

Front Half
Acetone
Container No. NA
Liquid Level Marked —
Sealed —

Filter
Container No. NA
Sealed

Description of Filter —

Samples Stored and Locked —

Back Half/Moisture
Container No. 2 1st 2ND Imp. 3RD Impinger

Liquid Level Marked —
Sealed —

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	TYPE I H_2O	100	761.8	769.2	7.4 ✓
2	TYPE I H_2O	100	776.9	779.3	2.4 ✓
3	—	—	689.1	689.7	0.6 ✓
4	SG	250	906.1	916.4	10.3 ✓
5					
6					
Total					20.7 ✓

Description of Impinger Catch: Clear

$B_{WS} = 2.3\%$

$I_{SO} = 100.6$

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M316 | Operator: ND | Nozzle ID: .152 | Thermocouple #: T3-6
Sampling Location: Baghouse Stack | Pbar: 30.08 | Ps: -1.1 | Assumed Bws: 1.5 | Filter #: —
Run Number: P-316-3 | Date: 9-1-16 | CO_2: CEM | O_2: CEM | Meter Box #: 11 | Y: 1.010 | ΔH@: 1.791
Pretest Leak Rate: 0.001 cfm @ 10 in.Hg. | Probe Length/Type: 3' GL | Pitot#: T3-6 | Post-Test Leak Rate: 0.001 cfm @ 3 in.Hg.
Pretest Leak Check: Pitot: √ Orsat: — | Stack Diameter: 35.5" | K: .5562 | Post-Test Leak Check: Pitot: √ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1020	581.030											
1	3:29	1020-1023	583.738	3.9	2.1	2.1	90	262	263	65	NA	73	73	3
2	7:05	1035-1038	586.550	3.8	2.0	2.0	93	259	261	65		71	71	3
3	10:46	1047-1051	589.554	3.7	2.0	2.0	97	262	262	64		71	71	3
4	14:20	1118-1121	592.312	3.8	2.0	2.0	100	258	262	64		71	71	3
5	17:49	1130-1133	594.976	3.8	2.0	2.0	103	253	253	60		71	71	3
6	21:23	1142-1145	597.797	3.9	2.0	2.0	105	261	257	61		72	71	3
1	25:01	1200-1204	600.648	4.0	2.1	2.1	107	261	263	58		72	72	3
2	28:37	1219-1223	603.475	4.0	2.1	2.1	110	259	261	59		73	72	3
3	32:00	1238-1242	606.315	4.0	2.1	2.1	114	264	261	59		73	73	3
4	35:31	1257-1300	608.966	3.9	2.0	2.0	117	257	264	60		74	74	3
5	39:10	1316-1319	611.790	3.9	2.0	2.0	118	257	259	60		75	74	3
6	42:55	1335-1339	614.727	3.7	1.9	1.9	118	259	261	60		75	75	3
1	46:30	1345-1349	617.482	3.7	1.9	1.9	115	257	263	61		75	74	3
2	50:08	1441-1445	620.343	4.0	2.1	2.1	116	265	265	61		75	75	3
3	53:44	1452-1455	623.115	4.0	2.1	2.1	117	263	260	59		76	75	3
4	57:10	1510-1513	625.801	4.0	2.1	2.1	116	262	262	62		76	76	3
5														
6														
1	57.17 minutes													
2														
3														
4														
5														
6														

33.697

ΔVm = 44.771 $\sqrt{\Delta p}$ = 1.9699 ΔH = 2.0312 Ts = 109 Tm = 73

Ave DN = 3.8813

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/1/16 Sample Box No. SB 2
Sample Location Posbrine Baghouse
Train Preparer BF
Sample Recovery Person BF
Comments 316

Run No. P-316-3
Job No. 050074.0172
Filter No. NA
Sample Head No. SH-5
Barometer No. TWC.com
Balance No. FB-2

Front Half
Acetone
Container No. NA Liquid Level Marked — Sealed —

Filter
Container No. NA Sealed —

Description of Filter —

Samples Stored and Locked —

Back Half/Moisture
Container No. 2 1ST & 2ND Impgrs; 3RD Impgr —

Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	Type I H_2O	100	791.7	793.5	1.8
2	Type I H_2O	100	771.6	773.6	2.0
3	Empty	-	653.1	654.2	1.1
4	Silica Gel	250	927.6	936.9	9.3
5					
6					
Total			3144	3158.2	14.2 ✓ MK

Description of Impinger Catch: Clear

B_{WS} = 1.5%

I_{WO} = 99.4%

METHOD 18 SAMPLING DATA

Company: AK MIDDLETOWN City: MIDDLETOWN, OH

Date: 8/30/16 Location: PRESSURE BAGHOUSE (STACK 1)

Time: 1026 - 1602 Run No: P-0031-1

Meter No: VB-1 Orifice, CC: _____

Barometric Pressure, in.Hg: 30.23 Operator: CJ

Ambient Temperature, EF: 84

1A = 19.44 ℓ, Tm = 87

1B = 19.5 ℓ, Tm = 91.5

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	25	25	1
Post-test			

TRAP #

Sample time, min	Clock time, (24-h)	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF		Vacuum, in.Hg	Probe temp
0 -	~~1026 - 1029~~	7657.65	1 L/min	85	85	3	264 61
2:40	1026 - 1029	7660.50		85	85	3	264 60
6:03	1043 - 1046	7663.69		87	87	3	266 60
9:30	1119 - 1122	7666.92		88	88	3	266 56
13:00	1139 - 1142	7670.27		89	89	3	263 62
16:28	1200 - 1204	7673.54		89	89	3	265 56
20:00	1211 - 1214	7677.09		89	89	3	264 58
23:22	1231 - 1234	7680.42		89	89	3	265 63
26:47	1244 - 1248	7683.85		90	90	3	266 60
30:03	1258 - 1302	7686.93		91	91	3	265 58
33:18	1316 - 1319	7689.98		92	92	3	265 55
36:33	1335 - 1338	7693.24		92	93	3	265 60
38:00	1345 - 1347	7694.60		93	93	3	265 52
40:00	1348 - 1350	7696.59		93	93	3	265 53

8

23

MISSED POINT CHANGING TUBES

ONE PUSH

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

METHOD 18 SAMPLING DATA

Company: AK STEEL

City: MIDDLETOWN, OH

Date: 8/30/16

Location: PUSHING [redacted] BH

Time: 1026 - 1602

Run No: P-0031-1

Meter No: VB-1

Orifice, CC:

Barometric Pressure, in.Hg: 30.23

Operator: CJ

Ambient Temperature, EF: 84

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	25	25	)
Post-test	24	24	1

TRAP # 18

Sample time, min	Clock time, (24-h)	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF		Vacuum, in.Hg	PROBE	CONDENSO
43:21	1442-1445	7699.67	1 L/min	94	94	3	265	57
46:43	1458-1501	7702.82	↓	94	94	3	265	60
49:59	1508-1511	7705.96		93	93	3	266	62
53:15	1525-1528	7709.27		94	94	3	265	53
56:38	1542-1545	7712.52		93	93	3	266	52
60:00	1559-1602	7715.72		92	92	3	266	53
		V_m = 58.07 liters		avg = 90.6°F				

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

16.05 L

Tm = 93

METHOD 18 SAMPLING DATA

Company: AK STEEL City: MIDDLETOWN, OH

Date: 8/31/16 Location: PUSHING BAGHOUSE

Time: 1020 - 1603 Run No: P-0031-2

Meter No: VB-1 Orifice, CC:

Barometric Pressure, in.Hg: 30.05 Operator: CJ

Ambient Temperature, EF: 79

2A = 19.672 l, Tm = 86

2B = 19.42 l, Tm = 93

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	25	25	1
Post-test			

TRAP #

29

19

Sample time, min	Clock time, (24-h)	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF		Vacuum, in.Hg	PROBE	CAN
0	-	7736.44	-	-		-	268	64
3:20	1020 - 1024	7739.74	1 L/min	82	82	3	269	64
6:44	1035 - 1039	7743.10		84	84	3	262	62
10:05	1049 - 1052	7746.50		86	86	3	263	63
13:22	1104 - 1107	7749.76		87	87	3	262	65
16:40	1123 - 1126	7752.95		87	87	3	261	66
20:00	1141 - 1145	7756.11		89	89	3	263	62
23:21	1200 - 1204	7759.24		90	90	3	259	60
26:42	1220 - 1224	7762.57		92	92	3	260	60
30:00	1239 - 1242	7765.96		94	94	3	263	59
33:19	1257 - 1301	7769.26		94	94	3	263	60
36:41	1316 - 1319	7772.52		94	94	3	260	62
40:00	1335 - 1339	7775.53		94	94	3	261	64

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

METHOD 18 SAMPLING DATA

Company: AK STEEL City: MIDDLETOWN, OH

Date: 8/31/16 Location: PRESSURE BH

Time: 1020 - 1603 Run No: P-0031-2

Meter No: VB-1 Orifice, CC: _____

Barometric Pressure, in.Hg: 30.05 Operator: CJ

Ambient Temperature, EF: 79

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	25	25	1
Post-test	25	25	1

TRAP # 10

Sample time, min	Clock time, (24-h)	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF		Vacuum, in.Hg	PROBE	CONDENS
43:20	1448 - 1452	7778.49	1 L/min	92	92	3	262	61
46:40	1459 - 1503	7781.79		90	90	3	264	59
50:00	1510 - 1514	7784.99		87	87	3	267	56
53:23	1525 - 1529	7788.16		83	83	3	265	57
56:41	1543 - 1546	7791.27		82	82	3	269	62
60:00	1600 - 1603	7794.41		83	83	3	268	65
		Vm = 57.97 l		Avg = 88.3 °F				

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

15.92 l, Tm = 86

EQ Environmental Quality Management, Inc.

METHOD 18 SAMPLING DATA

Company: AK STEEL

City: MIDDLETOWN, OH

Date: 9/1/16

Location: PUSHING BAGHOUSE

Time: 1020 -

Run No: P-0031-3

Meter No: VB-1

Orifice, CC:

Barometric Pressure, in.Hg: 30.08

Operator: CJ

Ambient Temperature, EF: 72

3A = 19.38 l, Tm = 72

3B = 16.36 l, Tm = 76

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test	24	24	1
Post-test			

TRAP II	Sample time, min	Clock time, (24-h)	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF		Vacuum, in.Hg	PROBE	COND
15	0	—	7795.50	—	—		—		
	3:17	10:20-1023	7798.71	1 L/min	69	69	3	262	59
	6:40	10:35-1038	7801.86	↓	71	71	3	261	59
	10:00	1047-1050	7805.08		72	72	3	265	59
	13:20	1118-1122	7808.40		73	73	3	265	60
	16:40	1130-1133	7811.66		73	73	3	263	60
√25 7814.88	20:00	1142-1145	7814.88		74	74	3	265	60
25 7818.19	23:21	1200-1204	7818.40		74	74	3	264	63
20	26:40	1219-1223	7821.53		75	75	3	264	64
	30:00	1238-1242	7824.84		76	76	3	264	66
	33:20	1257-1300	7828.17		77	77	3	263	62
	36:40	1316-1319	7831.47		77	77	3	265	57
√25 7834.76	40:00	1335-1338	7834.76	↓	78	78	3	263	59

7835.33

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

METHOD 18 SAMPLING DATA

Company: AK STEEL City: MIDDLETOWN, OH

Date: 9/1/16 Location: PUSHING BH

Time: 1020- Run No: P-0031-3

Meter No: VB-1 Orifice, CC: _____

Barometric Pressure, in.Hg: 30.08 Operator: CJ

Ambient Temperature, EF: 72 3C = 16.03 l, Tm = 78

VACUUM LEAK CHECK DATA

	Initial, in.Hg	Final, in.Hg	Time, min
Pre-test			
Post-test			

TRAP # 7

Sample time, min	Clock time, (24-h)	Meter volume, liters	Rotameter Setting	Dry gas meter temp. EF		Vacuum, in.Hg	PROBE	CONS
43:20	1441 - 1445	7838.61	1 L/min	78	78	3	263	59
46:40	1451 - 1455	7841.95		78	78	3	263	60
50:00	1510 - 1514	7845.19		78	78	3	264	57
53:20	1525 - 1529	7848.40		78	78	3	264	59
56:40	1543 - 1546	7851.53		78	78	3	265	58
60:00	1601 - 1604	7854.64	↓	78	78	3	265	55
		Vm = 59.14 liters		avg = 75.4 °F				

$$V_{std} = V_m \text{ liters} \times Y \times 17.647 \times \frac{P_b, in.Hg}{Tm, ^\circ R}$$

EQM

FIELD DATA SHEET

Plant: AK Middletown
Sampling Location: Combustion Stack
Run Number: C-316-01 Date: 9-8-16
Pretest Leak Rate: .000 cfm @ 8 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: —

Sample Type: M316 Operator: GD
Pbar: 30.00 Ps: -.8
CO_2: 3 O_2: 15
Probe Length/Type: 5' GI Pitot#: T5-8
Stack Diameter: 168" K: 59.7754

Nozzle ID: 0.50 Thermocouple #: T5-8
Assumed Bws: 12 Filter #: Bypass
Meter Box #: 5 Y: .993 ΔH@: 1.906
Post-Test Leak Rate: .000 cfm @ 4 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: ✓

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	0953	083.757											
1	2.5	0955	085.4	.03	1.1	1.1	370	236	261	67	N.A.	68	68	0
2	5	0958	087.2	.03	1.1	1.1	374	237	265	63		69	69	0
3	7.5	1000	088.3	.03	1.1	1.1	377	236	264	57		70	69	0
4	10	1003	089.7	.03	1.1	1.1	379	237	267	56		71	69	0
5	12.5	1005	091.2	.03	1.1	1.1	371	238	265	56		71	69	0
6	15	1008	092.6	.03	1.1	1.1	375	239	261	55		72	70	0
7	17.5	1010	094.0	.03	1.1	1.1	378	240	263	54		74	70	0
8	20	1013	095.4	.03	1.1	1.1	378	241	261	56		74	70	0
9	22.5	1015	097.0	.03	1.1	1.1	376	240	260	56		74	70	0
10	25	1018	098.5	.04	1.5	1.5	380	241	261	57		76	71	0
11	27.5	1020	099.9	.04	1.5	1.5	379	247	267	58		76	71	0
12	30	1023	101.9	.04	1.5	1.5	380	248	267	59		77	71	0
1	32.5	1025	103.6	.04	1.5	1.5	385	250	260	59		78	71	0
2	35	1028	105.2	.04	1.5	1.5	387	251	258	60		79	72	0
3	37.5	1030	106.9	.04	1.5	1.5	390	252	262	61		79	72	0
4	40	1033	108.6	.04	1.5	1.5	392	253	260	59		80	72	0
5	42.5	1035	110.0	.03	1.1	1.1	397	260	261	59		81	72	0
6	45	1038	111.5	.03	1.1	1.1	398	260	262	59		81	72	0
7	47.5	1040	113.0	.03	1.1	1.1	398	259	268	61		81	72	0
8	50	1043	114.5	.03	1.1	1.1	380	260	266	56		82	72	0
9	52.5	1045	116.0	.03	1.2	1.2	370	265	264	58		83	73	0
10	55	1048	117.6	.03	1.2	1.2	372	264	265	59		83	75	0
11	57.5	1050	119.2	.03	1.2	1.2	372	264	261	60		84	75	0
12	60	1053	120.718	.03	1.2	1.2	373	263	265	58		85	76	0

ΔVm = 36.961 $\overline{\sqrt{\Delta p}}$ = ~~.0447~~ .0410 NP $\overline{\Delta H}$ = 1.2 $\overline{Ts}$ = 380 $\overline{Tm}$ = 74

$\overline{\Delta p}$ = ~~.1966~~ NP

Δp_{avg} = .0329

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant: AK Steel Middletown
Run No.: C-316-1
Date: 9/8/16
Sample Box No.: SB-7
Job No.: 30274.0172
Sample Location: Combustion
Filter No.: NA
Train Preparer: DA
Sample Head No.: SH-3
Sample Recovery Person: DA
Barometer No.: TWC
Comments: M316 - formaldehyde
Balance No.: 2

Front Half
Acetone Container No.: NA
Liquid Level Marked: ____
Sealed: ____

Filter Container No.: NA
Sealed: ____

Description of Filter: —

Samples Stored and Locked: —

Back Half/Moisture
Container No.: 1st & 2ND Impinger, 3RD Empty

Liquid Level Marked: —
Sealed: /

Imp. No.	Contents	Initial Vol (ml)	Weight (grams) Initial	Final	Net
1	H_2O	100	759.2	839.7	80.5
2	H_2O	100	786.7	800.2	13.5
3	~~H2O~~ empty	— 693.8	~~694~~ 7DA	697.2	3.4
4	SG	250	916.4	924.6	8.2
5					
6					
Total					105.6

Description of Impinger Catch: Blackish 1st Imp.

Bws = 12.0%

Iso = 94.6%

JMP

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M316 | Operator: GD
Sampling Location: Combustion Stack | Pbar: 30.00 | Ps: -.8
Run Number: C-316-2 | Date: 9/8/16 | CO_2: 3 | O_2: 15
Pretest Leak Rate: .000 cfm @ 7 in.Hg. | Probe Length/Type: 5'61 | Pitot#: T5-8
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 168" | K: 59.7954

Nozzle ID: 0.50 | Thermocouple #: T5-8
Assumed Bws: 12 | Filter #: Bypass
Meter Box #: 5 | Y: 0.993 | ΔH@: 1.906
Post-Test Leak Rate: .000 cfm @ 4 in.Hg.
Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1246	120.953											
1	2.5	1248	122.5	.03	1.2	1.2	372	254	267	66	N.A.	76	76	0
2	5.0	1251	124.0	.03	1.2	1.2	373	260	269	63		78	78	0
3	7.5	1253	125.5	.03	1.2	1.2	374	261	268	62		79	78	0
4	10	1256	127.0	.03	1.2	1.2	375	266	270	60		80	79	0
5	12.5	1258	128.6	.03	1.2	1.2	376	258	268	59		81	79	0
6	15	1301	130.2	.03	1.2	1.2	378	258	266	58		82	79	0
7	17.5	1303	131.7	.03	1.2	1.2	379	257	265	59		83	79	0
8	20	1305	133.3	.03	1.2	1.2	382	256	269	62		84	79	0
9	22.5	1308	134.8	.03	1.2	1.2	371	258	263	63		85	80	0
10	25	1310	136.3	.03	1.2	1.2	378	260	265	59		85	80	0
11	27.5	1313	137.9	.03	1.2	1.2	380	263	267	60		87	81	0
12	30	1315	139.5	.04	1.5	1.5	380	265	263	59		87	81	0
1	32.5	1318	141.4	.04	1.5	1.5	383	266	268	58		88	81	0
2	35	1320	143.0	.04	1.5	1.5	384	264	266	57		89	81	0
3	37.5	1323	144.7	.04	1.5	1.5	385	264	268	58		90	81	0
4	40	1325	146.5	.04	1.5	1.5	387	262	267	58		90	82	0
5	42.5	1328	148.0	.04	1.5	1.5	386	263	267	58		90	82	0
6	45	1330	149.4	.03	1.2	1.2	388	263	265	57		91	83	0
7	47.5	1333	151.2	.03	1.2	1.2	389	265	266	59		91	83	0
8	50	1335	152.8	.03	1.2	1.2	392	265	261	63		91	83	0
9	52.5	1338	154.4	.03	1.2	1.2	394	267	265	64		92	83	0
10	55	1340	155.8	.03	1.1	1.1	396	265	266	60		93	84	0
11	57.5	1343	157.3	.03	1.2	1.2	372	260	267	58		93	85	0
12	60	1346	158.837	.03	1.2	1.2	370	263	264	57		94	85	0

ΔVm = 37.884 $\sqrt{\Delta p}$ = .1799 $\overline{\Delta H}$ = 1.27 $\overline{Ts}$ = 381 $\overline{Tm}$ = 84

$\overline{\Delta P}$ = .0325

VP

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel Middletown — Run No. C-316-2
Date 9/8/16 — Sample Box No. SB-2 — Job No. 52074.072
Sample Location Combustion stack — Filter No. NA
Train Preparer DA/BF — Sample Head No. 5
Sample Recovery Person DA — Barometer No. IWC-com
Comments Method 316 Formaldehyde — Balance No. 2

Front Half
Acetone
Container No. NA — Liquid Level Marked ✓ — Sealed NA

Filter
Container No. NA — Sealed —

Description of Filter _____

Samples Stored and Locked —

Back Half/Moisture
Container No. 1st & 2ND Imps; 3RD Impinger

Liquid Level Marked ✓ — Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	Type I H2O	100	789.5	868.0	78.5
2	Type I H2O	100	772.4	784.6	12.2
3	empty	—	655.2	658.0	2.8
4	SG	250	965.6	976.6	11.0
5					
6					
Total					104.5

Description of Impinger Catch: 1st & 2ND Impingers Blackish

Bws = 11.8%

Bso = 104.0%

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: M316 | Operator: NP
Sampling Location: Combustion Stack | Pbar: 30.00 | Ps: -.80
Run Number: C-316-3 | Date: 9-8-16 | CO_2: 3 | O_2: 15
Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 5' G1 | Pitot#: T5-8
Pretest Leak Check: Pitot: ✓ Orsat: — | Stack Diameter: 168" | K: 59.7954

Nozzle ID: 0.50 | Thermocouple #: T5-8
Assumed Bws: 10 | Filter #: NA
Meter Box #: 5 | Y: .993 | ΔH@: 1.906
Post-Test Leak Rate: .002 cfm @ 8 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1549	159.005											
1	2.5	1551	160.5	.03	1.2	1.2	390	252	266	65	N/A	87	86	0
2	5	1554	162.1	.03	1.2	1.2	375	263	267	65		87	87	0
3	7.5	1556	163.5	.03	1.2	1.2	376	264	270	65		87	87	0
4	10	1559	165.0	.03	1.2	1.2	378	264	270	64		87	87	0
5	12.5	1601	166.5	.03	1.2	1.2	376	264	264	64		88	87	0
6	15	1604	168.1	.03	1.2	1.2	375	263	268	63		88	87	0
7	17.5	1606	169.7	.03	1.2	1.2	378	266	275	63		88	87	0
8	20	1609	171.0	.03	1.2	1.2	378	267	276	63		88	87	0
9	22.5	1611	172.8	.03	1.2	1.2	379	264	270	63		90	87	0
10	25	1614	174.4	.03	1.2	1.2	379	263	268	63		90	88	0
11	27.5	1616	175.9	.03	1.2	1.2	380	264	260	62		90	88	0
12	30	1619	177.6	.03	1.2	1.2	379	267	259	62		90	88	0
1	32.5	1621	179.4	.03	1.2	1.2	379	263	269	61		91	87	0
2	35	1624	180.6	.03	1.2	1.2	378	264	263	61		92	87	0
3	37.5	1626	182.2	.03	1.2	1.2	378	264	269	61		93	88	0
4	40	1629	183.8	.03	1.2	1.2	380	267	271	60		93	88	0
5	42.5	1631	185.1	.03	1.2	1.2	379	265	264	60		93	88	0
6	45	1634	186.8	.03	1.2	1.2	382	262	272	61		94	88	0
7	47.5	1636	188.4	.03	1.2	1.2	380	262	271	61		94	88	0
8	50	1639	189.9	.03	1.2	1.2	376	265	272	62		95	89	0
9	52.5	1641	191.5	.03	1.2	1.2	389	265	264	62		95	89	0
10	55	1644	193.0	.03	1.2	1.2	386	264	268	62		95	89	0
11	57.5	1646	194.5	.03	1.2	1.2	381	264	273	63		96	90	0
12	60	1649	196.286	.03	1.2	1.2	384	264	271	64		96	90	0

ΔVm = 37.281 | $\sqrt{\Delta p}$ = .1732 | $\overline{\Delta H}$ = 1.2 | $\overline{Ts}$ = 380 | $\overline{Tm}$ = 89

Ave DP = .03

SAMPLE RECOVERY DATA

Plant AK Steel Middletown
Run No. C-316-3
Date 9/8/16
Sample Box No. 7
Job No. 5074.0172
Sample Location Combustion Stack
Filter No. NA
Train Preparer DA
Sample Head No. 3
Sample Recovery Person DA
Barometer No. TWC
Comments M316 - formaldehyde
Balance No. 2

Front Half
Acetone
Container No. NA
Liquid Level Marked _____
Sealed _____

Filter
Container No. NA
Sealed _____

Description of Filter NA

Samples Stored and Locked NA

Back Half/Moisture
Container No. 1st & 2ND Impingers & 3rd Impinger

Liquid Level Marked ✓
Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H2O	100	766.0	824.4	58.4
2	H2O	100	780.4	790.0	9.6
3	empty	-	692.5	696.0	3.5
4	Si-gel	200	909.8	924.1	14.3
5					
6					
Total					85.8

Description of Impinger Catch: 1st & 2ND Impingers - Dk brown

Bws = 10.1%

Too = 103.6%

EQM

FIELD DATA SHEET

Plant: AK Middletown Sample Type: 316 Operator: KP

Sampling Location: Combustion Stack Pbar: 30.24 Ps: -.9

Run Number: C-316-4 Date: 9-15-16 CO_2: 3 O_2: 15

Pretest Leak Rate: .001 cfm @ 10 in.Hg. Probe Length/Type: 6' GL Pitot#: T6-15P

Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 168" K: 53.113

Nozzle ID: .500 Thermocouple #: T6-15P

Assumed Bws: 10 Filter #: —

Meter Box #: 2 Y: 1.005 ΔH@: 1.687

Post-Test Leak Rate: .001 cfm @ 10 in.Hg.

Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	945	771.205											
1	5	950	774.7	.05	1.7	1.7	350	260	260	65	NA	61	61	0
2	10	955	778.1	.04	1.4	1.4	350	266	266	54		64	63	0
3	15	1000	781.5	.04	1.4	1.4	350	264	265	54		64	63	0
4	20	1005	784.8	.04	1.4	1.4	353	264	265	47		65	63	0
5	25	1010	788.2	.04	1.4	1.4	353	262	265	46		67	63	0
6	30	1015	791.5	.04	1.4	1.4	354	264	265	47		67	64	0
7	35	1020	795.0	.04	1.4	1.4	356	262	263	48		69	64	0
8	40	1025	798.4	.04	1.4	1.4	352	267	265	48		72	65	0
9	45	1030	801.8	.04	1.4	1.4	360	257	259	48		72	66	0
10	50	1035	805.2	.04	1.4	1.4	361	262	265	49		74	67	0
11	55	1040	808.7	.04	1.4	1.4	365	267	265	50		78	69	0
12	60	1045	812.122	.04	1.4	1.4	368	262	263	50	↓	79	70	0

ΔVm = 40.917 $\sqrt{\Delta p}$ = .2020 $\overline{\Delta H}$ = 1.425 $\overline{Ts}$ = 356 $\overline{Tm}$ = 67

Ave DP = .04083

JBF

Formaldehyde

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown — Run No. C-316-4
Date 9/15/16 — Sample Box No. SB-2 — Job No. 050074.0172
Sample Location Combustion Stack — Filter No. NA
Train Preparer BF — Sample Head No. SH-5
Sample Recovery Person BF — Barometer No. Tweco
Comments M 316 — Balance No. FB-2

Front Half
~~Acetone~~
Container No. E-316-4 — Liquid Level Marked ✓ — Sealed ✓

Filter
Container No. NA — Sealed NA

Description of Filter NA

Samples Stored and Locked ✓

Back Half/Moisture
Container No. NA

Liquid Level Marked NA — Sealed NA

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H_2O	100	788.5	881.9	93.4
2	H_2O	100	772.1	789.6	1.1
3	—	—	653.8	656.5	2.7
4	Silica Gel	250	964.0	973.8	9.8
5					
6					
Total					107.0

Description of Impinger Catch: clear

1 of

C-0031-1A
1B
1C

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: AK Steel Middletown
City: Middletown
Date: 9/8/16
Location: Combustion Stack
Time: 0935-0955-1A
Run #: C-0031-1A
Meter #: VB-2
Y-Factor: 1.085
Barometric Pressure, in.Hg: 30.00
Operator: [illegible]
Ambient Temperature, °F: ______
Purge Time: 10 min
1

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.	
Pre-test:	22	22	1	0.000 l 1A
Post-test:	5	5	1	0.00 l

	Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in.Hg)	Probe Temp, °F	Condenser
1A	0	0935	4449.03	1.0	86 86	3	260	50
	5	0940	4453.4	1.0	88 88	3	258	50
	10	0945	4458.4	1.1	88 88	3	262	51
	15	0950	4463.4	1.1	90 90	3	262	52
	20	0955	4468.36	1.1	90 90	3	260	54
1B	0	1008	4469.10	1.1	93 92	3	259	54
	5	1013	4474.30	1.1	93 92	3	257	56
	10	1018	4479.10	1.1	95 93	3	258	56
	15	1023	4484.05	1.1	94 94	3	259	55
1008-1028	20	1028	4488.84	1.1	97 97	3	258	56
	20							
	Leak check 22" @ 1 min = 0.00 l		Leak check 5" at 1 minute = 0.00 l					

Nitrogen purge/activated carbon packing in sample holding container: ______

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

1A = L1803694-34 VOST trio #9 = 19.33 l, Tm = 88

1B = L1803694-57 VOST trio #32 = 19.74 l, Tm = 94

EQM Environmental Quality Management, Inc.

C-0031-1C
L 1803694-29 Trio #4

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA 19.91 ℓ, Tm = 95

Company: AK Steel
Date: 9/8/16
Time: 1041-1101
Meter #: VB-2
Barometric Pressure, in.Hg: 30.00
Ambient Temperature, °F: _____

City: Middletown OH
Location: Combustion Stack
Run #: C-0031-1C
Y-Factor: 1.085
Operator: MK
Purge Time: 5

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.	
Pre-test:	25	25	1	0.00 ℓ 1C
Post-test:	5	5	1	0.00 ℓ

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)		Vacuum, (in.Hg)	Probe Temp, °F	Condenser
0	1041	4489.69	1.1	94	94	3	258	54
5	1046	4495.5	1.1	96	95	3	259	54
10	1051	4500.0	1.1	96	95	3	260	54
15	1056	4504.75	1.1	96	95	3	260	55
20	1101	4509.60	1.1	95	95	3	258	56
0	1112	4510.25	1.1	94	94	3	261	57
5	1117	4515.1	1.1	94	94	3	261	60
10	1122	4520.1	1.1	95	95	3	262	56
15	1127	4525.2	1.1	95	95	3	258	50
20	1132	4530.19	1.1	96	96	3	260	48
		Pair flow	8" ℓ/min = 0.00 ℓ					

1C
1D

Nitrogen purge/activated carbon packing in sample holding container: _____

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

C-0031-1D = 19.94 ℓ
L 1803694-30 Tm = 95
Trio #5

EQM Environmental Quality Management, Inc.

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: AK Steel - Middletown
Date: 9/8/16
Time: 1144 - 1204 / 1F
Meter #: VB-2
Barometric Pressure, in.Hg: 30.00
Ambient Temperature, °F: _____

City: Middletown, OH
Location: Combustion Stack
Run #: C-0031-1E
Y-Factor: 1.085
Operator: MK
Purge Time: _____

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.
Pre-test: 1E	22	22	1 0.00 e
Post-test: 1F	21	21	1 0.00 e

Pre test
5" e / min = 0.001
5" e / min = 0.00 l

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)		Vacuum, (in.Hg)	Probe Temp, °F	Condenser
0	1144	4530.85	1.1	97	96	3	267	48
5	1149	4535.63	1.1	98	97	3	258	49
10	1154	4540.05	1.1	97	97	3	261	49
15	1159	4544.8	1.1	98	98	3	259	50
20	1204	4549.68	1.1	98	97	3	262	49
0	1215	4550.32	1.1	99	99	2	257	50
5	1220	4555.4	1.1	99	99	2	260	52
10	1225	4560.2	1.1	101	99	2	258	51
15	1230	4564.55	1.1	102	100	2	259	52
20	1235	4569.32	1.1	102	100	2	263	53
	Post test							

1E

1F

Nitrogen purge/activated carbon packing in sample holding container: _____

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

C-0031-1E = L1803694-52 Trip #27 = 18.83 l, Tm = 97

C-0031-1F = L1803694-36 Trip #11 = 19.00 l, Tm = 100

EQM Environmental Quality Management, Inc.

C-0031-2A & 2B

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: AK Steel
Date: 9/8/16
Time: 1245-1305
Meter #: VB-2
Barometric Pressure, in.Hg: 30.00
Ambient Temperature, °F: _____

City: Middletown OH
Location: Coal-fired Stack
Run #: 2A/2B
Y-Factor: 1.085
Operator: [illegible]
Purge Time: _____

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.	
Pre-test: 2A	22	22	1	0.00 l
Post-test: 2B	25	25	1	0.00 l

	Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)		Vacuum, (in.Hg)	Probe Temp, °F	Condenser
	0	1245	4569.70	1.1	102	101	3	266	57
2A	5	1250	4575.2	1.1	103	102	3	266	58
2A	10	1255	4579.75	1.1	103	102	3	259	63
2A	15	1300	4584.8	1.1	104	103	3	258	59
2A	20	1305	4589.29	1.1	104	102	3	260	51
		Four four = 6.00 l @ 5"							
2B	0	1315	4589.85	1.1	101	101	3	262	49
2B	5	1320	4594.55	1.1	102	101	3	259	49
2B	10	1325	4599.5	1.1	102	102	3	259	49
2B	15	1330	4604.4	1.1	103	102	3	259	49
2B	20	1335	4608.75	1.1	102	101	3	258	50
		Four four							

Nitrogen purge/activated carbon packing in sample holding container: _____

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

C-0031-2A = L1803694-42 Tm̄ 17 = 19.59 l, Tm = 102.6

C-0031-2B = L1803694-37 Tm̄ 12 = 18.90 l, Tm = 102

EQM Environmental Quality Management, Inc.

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: AK Steel
Date: 9/8/16
Time: 1345-1405 / 1415-1435
Meter #: VB-2
Barometric Pressure, in.Hg: 30.00
Ambient Temperature, °F: _____

City: Middletown OH
Location: Combustion Stack
Run #: 2C / 2D
Y-Factor: 1.085
Operator: MK
Purge Time: _____

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.	
Pre-test: 2C	25	25	1	0.00 ℓ
Post-test: 2D	23	23	1	0.00 ℓ

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in.Hg)	Probe Temp, °F	Condenser °F
0	1345	4609.50	1.1	102 102	4	265	52
5	1350	4614.5	1.1	102 102	4	266	51
10	1355	4619.2	1.1	103 102	4	259	51
15	1400	4624.1	1.1	102 102	4	261	52
20	1405	4628.90	1.1	103 103	4	257	52
Post Test	5" @ 1 min = 0.00 ℓ						
0	1415	4629.55	1.1	103 102	4	254	54
5	1420	4634.45	1.1	103 102	4	260	55
10	1425	4639.2	1.1	104 103	4	260	55
15	1430	4644.1	1.1	104 103	4	257	58
20	1435	4648.95	1.1	105 105	4	~~258~~ 259	61

Nitrogen purge/activated carbon packing in sample holding container: _____

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

C-0031-2C L1803694-61 Trio 3 = 19.34 ℓ
T_m = 102

C-0031-2D L1803694-27 Trio 2 = 19.40 ℓ
T_m = 103

EQM Environmental Quality Management, Inc.

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: AK Steel
Date: 9/8/16
Time: 2E 1445-1505 / 2F
Meter #: VB-2
Barometric Pressure, in.Hg: 30.00
Ambient Temperature, °F: _____

City: Middletown, OH
Location: Coke Battery Stack
Run #: 2E / 2F
Y-Factor: 1.085
Operator: [illegible]
Purge Time: _____

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.
Pre-test: 2E	26	25	1 0.00 L
Post-test: 2F	23	23	1 0.00 L

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in.Hg)	Probe Temp, °F	Condenser
0	1445	4649.46	1.1	105 105	3	262	53
5	1450	4654.5	1.1	108 108	3	258	52
10	1455	4659.25	1.1	108 107	3	256	54
15	1500	4663.6	1.1	106 106	3	259	54
20	1505	4668.54	1.1	108 108	3	260	54
Post Test Lk	5"@1/min	= 0.00 L					
0	1512	4669.76	1.1	106 106	2	261	60
5	1517	4674.0	1.1	107 107	2	260	58
10	1522	4678.9	1.1	107 106	2	262	56
15	1527	4684.3	1.1	108 107	2	261	60
20	1532	4688.17	1.1	107 106	2	262	60

Nitrogen purge/activated carbon packing in sample holding container: _____

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

C-0031-2E L1803694-26 Trio #1 = 19.08 L, Tm = 107

C-0031-2F L1803694-60 Trio #35 = 18.41 L Tm = 107

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: AK Steel
Date: 9/8/16
Time: A 1548-1608 / B 1616-1636
Meter #: VB-2
Barometric Pressure, in.Hg: 30.00
Ambient Temperature, °F: _____

City: Middletown OH
Location: Combustion Stack
Run #: 3A / 3B
Y-Factor: 1.085
Operator: DKlein
Purge Time: _____

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.	
Pre-test:	25	25	1	0.00 l.
Post-test:	25	25	1	0.00 l

	Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)		Vacuum, (in.Hg)	Probe Temp, °F	Cyclones
	0	1548	4689.81	1.1	105	105	2	275	63
3A	5	1553	4693.4	1.1	107	105	2	261	62
	10	1558	4698.4	1.1	108	106	2	267	58
	15	1603	4703.3	1.1	108	108	2	258	60
	20	1608	4707.90	1.1	107	106	2	256	62
	Post Run 5" @ 1/min = 0.00 l							259	
	0	1616	4708.05	1.1	109	108	2	260	60
	5	1621	4712.75	1.1	109	108	2	257	62
3B	10	1626	4717.5	1.1	110	107	2	257	56
	15	1631	4722.1	1.1	110	110	2	258	57
	20	1636	4726.90	1.1	108	109	2	259	53
	Post Run 5" @ 1/min = 0.00 l								

Nitrogen purge/activated carbon packing in sample holding container: _____

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

C-0031-3A L1803694-51 Trio #26 = 18.03 l, Tm = 107

C-0031-3B L1803694-49 Trio # 24 = 18.85 l, Tm = 109

EQM Environmental Quality Management, Inc.

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: AK Steel
Date: 9/8/16
Time: 3C 1647-1707 / 3D 1715-1735
Meter #: UB-2
Barometric Pressure, in.Hg: 30.02
Ambient Temperature, °F: _____

City: Middletown, OH
Location: Combustion Stack
Run #: 3C / 3D
Y-Factor: 1.085
Operator: DMK
Purge Time: _____

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.	
Pre-test:	25	25	1	0.00 ℓ
Post-test:	24	24	1	0.00 ℓ

	Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting ℓ	Dry Gas Meter Temp., (°F)		Vacuum, (in.Hg)	Probe Temp, °F	Condenser °F
20	0	1647	4727.28	1.1	110	110	4	269	56
	5	1652	4732.4	1.1	110	109	4	260	58
	10	1657	4737.4	1.1	110	110	4	266	59
3C	15	1702	4742.5	1.1	110	109	4	266	60
40	20	1707	4747.67	1.1	110	109	4	258	60
		Post Test	6" @ 1 min = 0.00 ℓ						
40	0	1715	4748.05	1.1	110	109	2	260	52
	5	1720	4753.0	1.1	110	109	2	258	51
3D	10	1725	4757.7	1.1	109	108	2	258	53
	15	1730	4762.5	1.1	110	110	2	257	55
60	20	1735	4767.50	1.1	110	109	2	261	57
		Post	Post Test LC = 6" @ 1 min = 0.00 ℓ						

Nitrogen purge/activated carbon packing in sample holding container: _____

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

C-0031-3C L1803694-59 Trio # 34 = 20.39 ℓ, Tm = 110

C-0031-3D L1803694-39 Trio # 14 = 19.45 ℓ, Tm = 109

EQM Environmental Quality Management, Inc.

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: AK Steel
Date: 9/8/16
Time: 3E 1744-1804 / 3F 1811-1831
Meter #: VB-2
Barometric Pressure, in.Hg: 30.00
Ambient Temperature, °F: _____

City: Middletown, OH
Location: Coke Oven Stack
Run #: 3E / 3F
Y-Factor: 1.085
Operator: [illegible]
Purge Time: _____

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.	
Pre-test:	25	25	1	0.00 l
Post-test:	24	24	1	0.00 l

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)		Vacuum, (in.Hg)	Probe Temp, °F	Condenser
0	1744	4767.75	1.1	107	107	2	260	50
5	1749	4772.7	1.1	107	107	2	260	51
10	1754	4777.75	1.1	107	106	2	260	51
15	1759	4782.6	1.1	106	106	2	258	53
20	1804	4787.27	1.1	106	105	2	262	53
Post test	Leak check = 5" @ l/min = 0.00 l							
0	1811	4787.73	1.1	103	103	4	260	49
5	1816	4793.05	1.1	104	103	4	261	51
10	1821	4797.7	1.1	104	104	4	260	50
15	1826	4802.6	1.1	104	104	4	260	53
20	1831	4807.04	1.1	103	103	4	257	52
Post test	LC = 5" @ l/min = 0.00 l							

3E

3F

Nitrogen purge/activated carbon packing in sample holding container: _____

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

C-0031-3E L1803694-31 Trio #6 = 19.52 l, Tm = 106

C-0031-3F L1803694-56 Trio # 31 = 19.31 l, Tm = 104

EQM Environmental Quality Management, Inc.

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: AK Steel
Date: 9/15/12
Time: 4A 0945-1005 / 4B 1020-1640
Meter #: VB-2
Barometric Pressure, in.Hg: 30.24
Ambient Temperature, °F: _____

City: Middletown, OH
Location: Combustion Stack
Run #: C-0031-4A
Y-Factor: 1.085
Operator: MLD
Purge Time: _____

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.	
Pre-test:	25	25	1	0.00 l
Post-test:	22	22	1	0.00 l

	Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)		Vacuum, (in.Hg)	Probe Temp, °F	Condenser °F
1.40	0	0945	4811.00	1.0 l	~~68~~	~~68~~	2	~~252~~	~~43~~
	5	0950	4815.30	1.0 l	70	68	2	257	43
4A	10	0955	4819.9	1.0 l	71	69	2	259	44
	15	1000	4824.8	1.0 l	72	70	2	259	46
	20	1005	4829.44	1.0 l	74	71	2	260	43
	Post test 5" Hg @ 1 min. = 0.00 liters								
	0	1020	4829.84	1.0 l	74	74	2	258	45
4B	5	1025	4834.75	1.0 l	75	75	2	259	47
	10	1030	4839.4	1.0 l	76	75	2	266	48
	15	1035	4843.9	1.0 l	77	76	2	264	48
	20	1040	4848.72	1.0 l	76	76	2	~~264~~	~~47~~
	Post test 5" Hg @ 1 min. = 0.00 l								

Nitrogen purge/activated carbon packing in sample holding container: _____

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

4A L1826178-2 Trip #2 = 18.44 l, Tm = 70

4B L1826178-5 Trip #5 = 18.88 l, Tm = 75

EQM Environmental Quality Management, Inc.

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: AK Steel
Date: 9/15/16
Time: 4C 1055 - 1115 4D 1126 - 1146
Meter #: VB 2
Barometric Pressure, in.Hg: 30.24
Ambient Temperature, °F: _____

City: Middletown, OH
Location: Combustion Stack
Run #: E-0031-4C / E-0031-4D
Y-Factor: 1.085
Operator: [illegible]
Purge Time: _____

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.	
Pre-test:	25	25	1	0.00 l
Post-test:	25	25	1	0.00 l

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)		Vacuum, (in.Hg)	Probe Temp, °F	Condenser °F
220								
0	1055	4849.15	1.0 l	75	75	2	260	48
4C 5	1100	4854.0	1.0 l	76	77	2	256	49
10	1105	4858.7	1.0 l	77	78	2	256	50
15	1110	4863.4	1.0 l	78	78	2	257	50
20	1115	4868.26	1.0 l	79	77	2	258	48
Post leak	5" Hg @ 1 min = 0.00 l							
0	1126	4868.67	1.0	78	78	3	257	48
4D 5	1131	4873.5	1.0	79	79	3	258	48
10	1136	4878.1	1.0	80	79	3	258	48
15	1141	4882.8	1.0	82	80	3	258	47
20	1146	4887.65	1.0	83	80	3	261	49
Post leak	5" Hg @ 1 min = 0.00 l							

Nitrogen purge/activated carbon packing in sample holding container: _____

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

4C = L1826178-10 Tm 10 = 19.11 l, Tm = 77

4D = L1826178-11 Tm 11 = 18.98 l, Tm = 80

EQM Environmental Quality Management, Inc.

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: AK Steel
Date: 9/15/16
Time: 4E 1158-1218 / 4F 1228-1248
Meter #: UB-2
Barometric Pressure, in.Hg: 30.24
Ambient Temperature, °F: _____

City: Middletown, OH
Location: Combustion Stack
Run #: C-0031-4E/4F
Y-Factor: _____
Operator: [illegible]
Purge Time: _____

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.	
Pre-test:	25	25	1	0.00 ℓ
Post-test:	25	25	1	0.00 ℓ

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)		Vacuum, (in.Hg)	Probe Temp, °F	Ambient °F
4E 3rd 0	1158	4888.816	1.0 ℓ	83	83	2	260	49
5	1203	4893.15	1.0 ℓ	86	84	2	257	50
10	1208	4898.10	1.0 ℓ	87	85	2	261	50
15	1213	4903.05	1.0 ℓ	88	85	2	255	50
20	1218	4907.63	1.0 ℓ	90	87	2	266	50
Post Air 5" Hg @ 1/min = 0.00 ℓ								
4F 3rd 0	1228	4908.42	1.0 ℓ	89	88	2	255	51
5	1233	4913.0	1.0 ℓ	90	89	2	255	51
10	1238	4917.9	1.0 ℓ	89	88	2	258	51
15	1243	4922.5	1.0 ℓ	90	89	2	257	51
20	1248	4927.34	1.0 ℓ	88	88	2	260	51
Post Air 5" Hg @ 1/min = 0.00 ℓ								

Nitrogen purge/activated carbon packing in sample holding container: _____

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

4E = L1826178-6 Trio #6 = 19.47 ℓ, T_m = 86

4F = L1826178-3 Trio #3 = 19.0 ℓ, T_m = 89

HYDROGEN CHLORIDE AND HYDROGEN FLUORIDE

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: HCl/26A | Operator: GD
Sampling Location: Baghouse 3 | Pbar: 29.95 | Ps: -1.9
Run Number: Run 26-1 | Date: 8/23/16 | CO_2: CEM | O_2: CEM
Pretest Leak Rate: .002 cfm @ 10 in.Hg. | Probe Length/Type: 3' GI | Pitot#: T3-5
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: ~~0.1130~~ 2.0991

Nozzle ID: 0.213 | Thermocouple #: T3-5
Assumed Bws: 1.7 | Filter #: Untared
Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783
Post-Test Leak Rate: 0.002 cfm @ 18 in.Hg.
Post-Test Leak Check: Pitot: ✓ | Orsat: NA

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature BF Probe	Temperature BF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	1021-	828.052											
1	3:30	1025	831.771	3.1	6.1	4.2	94	250	260	58	N.A.	67	67	18
2	6:40	1036-	835.063	3.1	6.1	4.2	99	252	260	56		67	67	18
3	10:00	1045-1049	838.507	3.3	6.5	4.2	101	260	259	57		68	68	18
4	13:22	1113-1117	842.025	3.4	6.7	4.2	104	254	259	58		69	69	18
5	16:38	1126-1129	845.423	3.2	6.3	4.0	104	261	260	59		70	70	18
6	20:01	1143-1146	849.020	3.0	5.8	4.0	112	258	259	59		71	71	18
1	23:10	1201-1204	852.238	3.0	5.9	3.8	112	256	260	57		72	72	18
2	26:29	1219-1222	855.778	3.2	6.3	4.0	109	258	258	61		73	73	17
3	29:52	1239-1243	859.174	3.1	6.0	4.0	120	251	260	62		74	74	18
4	33:15	1256-1300	862.534	2.9	5.6	3.8	121	256	260	62		74	74	17.5
5	36:17	1317-1319	865.719	3.2	6.2	3.9	123	249	259	61		75	75	17.5
6	39:37	1334-1337	869.202	3.1	6.0	4.0	118	256	259	62		75	75	17.5
1														
2														
3	39.62 minutes													
4														
5														
6														
1														
2														
3														
4														
5														
6														✓ 05

Port Change

ΔVm = 41.150 $\sqrt{\Delta p}$ = 1.7698 ΔH = 4.025 Ts = 110 | $\overline{Tm}$ = 71

$\overline{\Delta P}$ = 3.1333

✓ E2

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 8/23/16 Sample Box No. 5
Sample Location Pushing Baghouse Stack 1
Train Preparer EZ/GD
Sample Recovery Person DA
Comments Method 26A

Run No. P-26-1
Job No. 50074.0172
Filter No. Teflon
Sample Head No. 2
Barometer No. TWC: co-
Balance No. 2

Front Half
Acetone
Container No. NA Liquid Level Marked — Sealed —

Filter
Container No. Teflon Sealed ✓

Description of Filter clean

Samples Stored and Locked NA

Back Half/Moisture
Container No. H_2SO_4 Impingers

Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	0.1 N H_2SO_4	50	706.8	709.4	2.6
2	0.1 N H_2SO_4	100	763.9	766.5	2.6
3	0.1 N H_2SO_4	100	774.4	773.3	-1.1
4	0.1 N NaOH	100	756.2	754.7	-1.5
5	0.1 N NaOH	100	762.0	762.2	0.2
6	Silica Gel	250g	926.1	936.5	10.4
Total					13.2 ✓

Description of Impinger Catch: clear

$B_{WS} = 1.5\%$

$B_{WO} = 73.7\%$

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: HCL / M26A | Operator: GD
Sampling Location: P. Baghouse 3 | Pbar: 29.95 | Ps: -1.9
Run Number: P-26-2 | Date: 8-23-16 | CO_2: CEM | O_2: CEM
Pretest Leak Rate: .001 cfm @ 18 in.Hg. | Probe Length/Type: 3'GI | Pitot#: T3-4
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: 2.0999

Nozzle ID: 0.213 | Thermocouple #: T3-4
Assumed Bws: 1.7 | Filter #: Untared
Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783
Post-Test Leak Rate: .002 cfm @ 19 in.Hg.
Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1352	870.268											
1	326	1355	873.264	2.8	5.4	2.9	123	250	262	60	N.A.	76	76	17.5
2	630	1442-1446	876.855	3.0	5.9	3.0	113	249	258	59		77	77	18.0
3	928	1452-1455	880.639	3.0	5.9	3.5	116	251	259	61		77	77	18.0
4	1227	1505-1509	884.488	3.0	5.9	3.1	118	253	258	60		78	78	18.0
5	1420	1518-1525	887.799	2.9	5.7	3.2	118	253	259	59		78	78	18.0
6	1644	1540-1543	891.500	3.0	5.9	3.2	117	250	258	58		79	79	18.0
1	1923	1557-1601	895.018	2.9	5.7	2.7	119	251	260	55		80	79	18.5
2	2145	1618-1618	898.342	2.9	5.7	2.9	112	255	260	54		80	80	18.5
3	2430	1631-1634	901.736	2.8	5.6	2.8	112	258	260	56		80	80	18.5
4	2650	1653-1656	905.167	2.8	5.6	2.9	111	261	259	58		80	80	18.5
5	2837	1707-1710	908.529	2.8	5.6	2.8	111	255	258	58		79	79	18.0
6	3120	1733-1738	912.268	2.8	5.6	2.9	108	261	260	59		78	79	18.0
1														
2														
3	31.33 minutes													
4														
5														
6														
1														
2														
3														
4														
5														
6														

$\Delta Vm = 42.000\sqrt{\Delta p} = 1.7003$ $\overline{\Delta H} = 2.9917$ $\overline{Ts} = 115$ $\overline{Tm} = 78.5$

$\overline{\Delta P} = 2.8917$

150 97.8

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 8/23/16 Sample Box No. 4
Sample Location Pressure Baghouse
Train Preparer EZ/GD
Sample Recovery Person CJ
Comments Method 26

Run No. P-26-2
Job No. 050074.0172
Filter No. Untared Teflon
Sample Head No. 11
Barometer No. TVC.com
Balance No. 4

Front Half
Acetone
Container No. NA Liquid Level Marked — Sealed —

Filter
Container No. Teflon Sealed ✓

Description of Filter Clean

Samples Stored and Locked —

Back Half/Moisture
Container No. P26-2 H_2SO_4 Impingers

Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	0.1N H_2SO_4	50	686.9	689.9	3.0
2	0.1N H_2SO_4	100	766.3	767.5	1.2
3	0.1N H_2SO_4	100	740.9	741.1	0.2
4	0.1N NaOH	100	752.8	752.5	-0.3
5	0.1N NaOH	100	771.4	770.0	-1.4
6	Silica Gel	250	932.6	943.3	10.7
Total					13.4

JCS

Description of Impinger Catch: clear

Bws = 1.5%

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: HCl/26A | Operator: GD | Nozzle ID: .156 | Thermocouple #: T3-4
Sampling Location: P. Baghouse #3 | Pbar: 29.97 | Ps: -1.9 | Assumed Bws: 1.7 | Filter #: UNTARED
Run Number: P-26-3 | Date: 8/24/16 | CO_2: | O_2: | Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783
Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 3'GI | Pitot#: T3-4 | Post-Test Leak Rate: .00 cfm @ 10 in.Hg.
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: .6106 | Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1027-	912.702											
1	3:04	1031	915.527	3.2	1.9	1.9	87	260	260	64	N.A.	73	72	5.0
2	5:52	1040-1044	918.155	3.0	1.8	1.8	99	258	260	59		76	74	5.0
3	9:24	1054-1058	920.515	3.0	1.7	1.7	110	256	260	57		77	75	4.5
4	12:57	1107-1111	923.061	3.3	1.9	1.9	111	267	260	58		78	77	5.0
5	16:14	1124-1128	925.588	3.3	1.9	1.9	115	261	259	63		79	78	5.0
6	19:52	1139-1142	928.157	3.1	1.8	1.8	114	255	260	58		80	78	5.0
1	23:30	1158-1201	930.742	3.1	1.8	1.8	108	257	259	57		79	78	5.0
2	27:03	1217-1221	933.309	3.2	1.8	1.8	112	260	259	58		78	77	5.0
3	30:37	1236-1240	936.012	3.3	1.9	1.9	114	257	260	60		77	77	5.0
4	34:07	1255-1259	938.640	3.0	1.7	1.7	115	261	260	57		77	77	5.0
5	37:30	1314-1318	941.244	3.1	1.8	1.8	112	259	259	56		78	77	10.0
6	40:59	1333-1336	943.592	3.0	1.7	1.7	113	257	260	58		78	77	7.0
1	44:21	1350-1354	946.018	3.3	1.9	1.9	112	258	260	59		78	78	6.5
2	47:45	1438-1442	948.438	3.2	1.8	1.8	112	262	259	57		77	77	5.5
3	51:18	1455-1459	951.134	3.3	1.9	1.9	111	257	260	56		78	77	6.5
4	54:51	1506-1509	954.025	3.2	1.8	1.8	113	259	259	58		78	77	7.0
5	58:01	1523-152	956.627	3.2	1.8	1.8	114	259	259	59		78	78	6.0
6														
1														
2														
3														
4														150=98.7
5														
6														

$\Delta Vm = 43.925\sqrt{\Delta p} = 1.7787\Delta H = 1.82\,\overline{Ts} = 110$ $\quad \overline{Tm} = 77$

$\overline{\Delta p} = .3.1647$

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EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel Middletown
Run No. P-26-3
Date 8/24/16
Sample Box No. _____
Job No. 050074.0172
Sample Location Pressure Baghouse
Filter No. —
Train Preparer EZ/CD
Sample Head No. 6
Sample Recovery Person CJ
Barometer No. TWC.com
Comments M26
Balance No. 2

Front Half
Acetone
Container No. _____
Liquid Level Marked _____
Sealed _____

Filter
Container No. _____
Sealed _____

Description of Filter _____

Samples Stored and Locked _____

Back Half/Moisture P-26-3
Container No. 0.1 N H_2SO_4

Liquid Level Marked ✓
Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	0.1 N H_2SO_4	50	687.8	693.1	5.3
2	↓	100	790.6	793.9	3.3
3	↓	100	773.5	773.6	0.1
4	0.1 N NaOH	100	778.6	777.9	-0.7
5	↓	100	763.2	764.0	0.8
6	SG	250	928.8	941.0	12.2
Total					21.0

Description of Impinger Catch: clear

Bws = 2.2%

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: HCl/M26A | Operator: GD
Sampling Location: P Baghouse #3 | Pbar: 30.30 | Ps: -1.9
Run Number: P-26-4 | Date: 8-25-16 | CO_2: CEMs | O_2: CEMs
Pretest Leak Rate: .002 cfm @ 11 in.Hg. | Probe Length/Type: 3'61 | Pitot#: T3-4
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5 | K: .6106

Nozzle ID: .156 | Thermocouple #: T3-4
Assumed Bws: 1.7 | Filter #: UNTARED
Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783
Post-Test Leak Rate: .001 cfm @ 9 in.Hg.
Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature BF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1028-	958.406											
1	3:30	1031	961.020	3.2	1.9	1.9	102	248	259	62	N.A.	77	77	5.5
2	6:58	1042-1046	963.632	3.1	1.8	1.8	106	250	258	59		77	77	5.5
3	10:29	1054-1058	966.268	3.1	1.8	1.8	112	260	259	57		77	77	5.5
4	13:55	1123-1126	969.075	3.4	1.9	1.9	120	257	259	58		78	77	6.0
5	17:30	1134-1137	971.803	3.2	1.8	1.8	126	261	259	60		78	78	6.0
6	21:00	1145-1149	974.496	3.1	1.7	1.7	123	260	259	57		79	78	6.0
1	24:37	1159-1203	977.068	3.0	1.7	1.7	119	258	258	56		79	78	5.5
Port change → 2	28:16	1218-1222	979.656	2.8	1.6	1.6	115	257	259	57		80	79	7.0
3	31:50	1238-1241	982.213	2.9	1.7	1.7	117	258	259	58		80	79	7.0
4	35:20	1257-1300	984.770	3.0	1.7	1.7	118	254	260	59		80	80	7.0
5	38:54	1316-1319	987.491	3.3	1.9	1.9	116	260	260	57		81	80	8.0
6	42:17	1335-1338	990.131	3.1	1.8	1.8	118	259	258	58		81	81	8.0
1	45:50	1350-1354	992.868	3.0	1.7	1.7	123	254	259	59		82	81	7.5
2	49:15	1435-1439	995.411	3.0	1.7	1.7	122	254	259	60		83	83	7.0
3	52:40	1449-1452	998.048	3.2	1.8	1.8	123	259	260	57		84	83	7.0
4	55:18	1506-1509	1000.733	3.2	1.8	1.8	121	263	261	59		84	84	7.0
5														
6														
1														
2														
3														
4														
5														
6														

ΔVm = 42.327 ✓ $\sqrt{\Delta p}$ = 1.7602 ✓ $\sqrt{\Delta H}$ = 1.77 ✓ Ts = 118 ✓ $\overline{Tm}$ = 80 ✓

$\overline{\Delta P}$ = 3.1

SAMPLE RECOVERY DATA

Plant AK Steel - Middletown
Run No. P-26-4
Date 8/25/16
Sample Box No. SO-5
Job No. 5274.0172
Sample Location Pushings Baghouse Stack 3
Filter No. Teflon
Train Preparer DA
Sample Head No. 2
Sample Recovery Person DA
Barometer No. TWC.com
Comments Method 26
Balance No. 2

Front Half
Acetone
Container No. NA
Liquid Level Marked —
Sealed —

Filter
Container No. Teflon
Sealed —

Description of Filter Clean

Samples Stored and Locked —

Back Half/Moisture
Container No. H2SO4 Impingers

Liquid Level Marked —
Sealed —

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	0.1N H2SO4	100	703.4	709.1	5.7
2	0.1N H2SO4	100	771.6	775.5	3.9
3	0.1N H2SO4	100	781.8	782.2	0.4
4	0.1N NaOH	100	754.7	755.9	1.2
5	0.1N NaOH	100	762.2	762.1	-0.1
6	SG	250	936.5	953.8	17.3
Total					28.4

Description of Impinger Catch: Clear

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EQM C-26-1

FIELD DATA SHEET

Plant: PK Steel | Sample Type: HCl/HF | Operator: NP
Sampling Location: Combustion Stack | Pbar: 30.20 | Ps: -0.80
Run Number: C-HCl-1 | Date: 9/6/16 | CO_2: 3 | O_2: 15
Pretest Leak Rate: 0.004 cfm @ 12 in.Hg. | Probe Length/Type: 6' Glass | Pitot#: TG-15P
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 168" | K: 53.113

Nozzle ID: 0.500 | Thermocouple #: TG-15P
Assumed Bws: 10 | Filter #: Teflon Mem
Meter Box #: 2 | Y: 1.005 | ΔH@: 1.687
Post-Test Leak Rate: .02 cfm @ 18 in.Hg.
Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	1450	898.160											
1	2.5	1452	899.8	0.04	1.5	1.5	302	266	255	65	N/A	88	89	4
2	5.0	1455	901.5	.03	1.2	1.2	298	264	262	65		88	89	4
3	7.5	1457	903.2	.04	1.5	1.5	305	264	265	62		88	89	3
4	10	1500	904.9	.04	1.5	1.5	300	264	266	58		88	89	3
5	12.5	1502	906.6	.04	1.5	1.5	311	264	264	57		89	93	4
6	15	1505	908.3	.04	1.5	1.5	304	264	264	57		90	89	4
7	17.5	1507	910.1	.04	1.5	1.5	300	264	264	57		89	89	5
8	20	1510	911.8	.04	1.5	1.5	291	264	263	58		89	89	5
9	22.5	1512	913.6	.04	1.5	1.5	292	264	264	58		90	89	5
10	25	1515	915.4	.04	1.5	1.5	300	264	262	59		90	89	5
11	27.5	1517	917.2	.03	1.2	1.2	292	263	264	60		91	89	5
12	30	1520	918.9	.04	1.5	1.5	308	266	260	61		93	89	5
1	32.5	1535	920.6	.04	1.5	1.5	306	263	265	64		94	90	7
2	35	1537	922.3	.04	1.5	1.5	306	265	269	64		91	90	10
3	37.5	1540	924.1	.04	1.5	1.5	280	262	263	56		92	90	10
4	40	1542	925.8	.04	1.5	1.5	265	264	263	56		92	90	10
5	42.5	1545	927.5	.03	1.2	1.2	285	265	265	55		93	90	10
6	45	1547	929.2	.04	1.5	1.5	299	263	262	55		93	90	11
7	47.5	1550	930.9	.03	1.1	1.1	314	265	264	56		93	90	13
8	50	1553	932.5	.04	1.5	1.5	307	264	263	57		93	90	14
9	52.5	1555	934.2	.04	1.5	1.5	311	263	265	57		93	90	15
10	55	1558	935.9	.04	1.5	1.5	309	263	263	58		93	90	15
11	57.5	1600	937.5	.04	1.5	1.5	314	264	264	59		94	90	17
12	60	1602	939.057	.04	1.5	1.5	310	264	263	59	✓	94	90	17

ΔVm = 40.897 $\sqrt{\Delta p}$ = .1955 $\overline{\Delta H}$ = 1.4458 $\overline{Ts}$ = 300 $\overline{Tm}$ = 90

Ave DP = .0383

150 - 98.0

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel Middletown — Run No. C-HCl-1 (26)
Date 9/6/16 — Sample Box No. SB-5 — Job No. 5274.0172
Sample Location Combustion Stack — Filter No. Teflon
Train Preparer DA — Sample Head No. SH-9
Sample Recovery Person CS/RK — Barometer No. RWC.on
Comments M26 — Balance No. 2

Front Half
Acetone
Container No. N/A — Liquid Level Marked NA — Sealed N/A

Filter
Container No. N/A — Sealed N/A

Description of Filter N/A

Samples Stored and Locked N/A

Back Half/Moisture
Container No. C-HCl-1 H_2SO_4

Liquid Level Marked ✓ — Sealed

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	0.1N H_2SO_4	50	710.2	762.0	51.8
2	0.1N H_2SO_4	rw	782.0	809.9	27.9
3	0.1N H_2SO_4	rw	~~953~~ DA 767.8	772.4	4.6
4	0.1N NaOH	rw	755.9	755.0	-0.9
5	0.1N NaOH	rw	762.1	772.5	10.4
6	SG	250	953.8	966.1	12.3
Total					106.1

Description of Impinger Catch: yellow tint

Bws = 11.1-1.

MP

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: HCL/26A | Operator: NP | Nozzle ID: .500 | Thermocouple #: T6-15P

Sampling Location: Combustion Stack | Pbar: 30.00 | Ps: -.90 | Assumed Bws: 10 | Filter #: untared QZ

Run Number: C-26A-2 | Date: 9-8-16 | CO_2: 3 | O_2: 15 | Meter Box #: 2 | Y: 1.005 | ΔH@: 1.687

Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 6' GL | Pitot#: T6-15P | Post-Test Leak Rate: .001 cfm @ 10 in.Hg.

Pretest Leak Check: Pitot: ✓ Orsat: — | Stack Diameter: 168" | K: 53.113 | Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1008	199.274											
1	2.5	1010	200.9	.04	1.4	1.4	324	260	260	65	NA	70	70	3
2	5	1013	202.7	.04	1.4	1.4	312	265	264	65		75	77	3
3	7.5	1015	204.4	.04	1.4	1.4	321	263	266	65		73	73	3
4	10	1018	206.2	.04	1.4	1.4	322	263	263	65		73	72	3
5	12.5	1020	207.9	.04	1.5	1.5	319	265	266	64		74	73	3
6	15	1023	209.7	.04	1.5	1.5	323	262	265	64		75	73	3
7	17.5	1025	211.4	.04	1.5	1.5	330	263	261	64		76	73	3
8	20	1028	213.2	.04	1.5	1.5	344	265	264	66		77	74	3
9	22.5	1030	214.8	.04	1.4	1.4	387	263	264	65		78	74	3
10	25	1033	216.5	.04	1.3	1.3	390	264	263	64		79	74	3
11	27.5	1035	218.2	.04	1.3	1.3	393	262	264	59		81	75	3
12	30	1038	219.8	.04	1.3	1.3	396	265	264	58		82	75	3
1	32.5	1040	221.6	.04	1.3	1.3	397	265	264	58		82	75	3
2	35	1043	223.2	.04	1.3	1.3	397	264	264	58		82	85	3
3	37.5	1045	224.9	.04	1.4	1.4	367	265	264	57		84	77	3
4	40	1048	226.5	.04	1.4	1.4	368	265	264	57		85	77	3
5	42.5	1050	228.4	.04	1.4	1.4	369	265	264	57		86	78	3
6	45	1053	230.1	.04	1.4	1.4	370	265	264	57		86	78	3
7	47.5	1055	231.9	.04	1.4	1.4	372	264	265	58		86	79	3
8	50	1058	233.5	.04	1.4	1.4	371	264	264	58		86	79	3
9	52.5	1100	235.3	.04	1.4	1.4	370	265	265	59		87	79	3
10	55	1103	237.2	.04	1.4	1.4	368	265	265	59		87	80	3
11	57.5	1105	239.0	.04	1.4	1.4	372	264	265	59		87	80	3
12	60	1108	240.436	.04	1.4	1.4	371	265	264	60	✓	88	81	3

ΔVm = 41.162 | $\overline{\sqrt{\Delta p}}$ = .2 | $\overline{\Delta H}$ = 1.4 | $\overline{Ts}$ = 361 | $\overline{Tm}$ = 78

Ave DP: .04

NP

SAMPLE RECOVERY DATA

Plant AK Steel Middletown
Date 9/8/16 Sample Box No. SB-5
Sample Location Combustion Stack
Train Preparer CS
Sample Recovery Person DA
Comments Method 26A

Run No. C-26-2
Job No. 5074.0172
Filter No. Quartz
Sample Head No. 9
Barometer No. TWC
Balance No. 2

Front Half
Acetone
Container No. NA Liquid Level Marked _____ Sealed _____

Filter
Container No. NA Sealed _____

Description of Filter _____

Samples Stored and Locked _____

Back Half/Moisture
Container No. 0.1N H2SO4 Imps

Liquid Level Marked _____ Sealed _____

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	H2SO4	50	708.3	756.3	48.0
2	H2SO4	100	786.1	827.7	41.6
3	H2SO4	100	757.7	767.2	9.5
4	Wolf	100	755.0	772.8	17.8
5	Wolf	100	772.5	754.5	-18.0
6	SG	250	966.1	974.8	8.7
Total					107.6

Description of Impinger Catch: Clear

Bws = 11.0%
I50 = 102.0%

JNP

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: HCL | Operator: NP
Sampling Location: combustion stack | Pbar: 30.00 | Ps: -.80
Run Number: C-26A-3 | Date: 9-8-16 | CO_2: 3 | O_2: 15
Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 6' GL | Pitot#: TE-15P
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 168 | K: 53.113

Nozzle ID: .500 | Thermocouple #: TE-15P
Assumed Bws: 10 | Filter #: Untared Oz
Meter Box #: 2 | Y: 1.005 | ΔH@: 1.687
Post-Test Leak Rate: .001 cfm @ 10 in.Hg.
Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1155	241.600											
1	2.5	1157	243.2	.04	1.5	1.5	~~326~~	250	264	65	~~151~~	79	80	3
2	5	1200	245.1	.04	1.4	1.4	374	264	270	65		80	80	3
3	7.5	1202	246.9	.04	1.4	1.4	375	265	268	65		79	80	3
4	10	1205	248.7	.04	1.4	1.4	376	264	265	65		80	80	3
5	12.5	1207	250.6	.04	1.4	1.4	379	264	267	57		82	80	3
6	15	1210	252.3	.04	1.4	1.4	380	264	267	57		82	80	3
7	17.5	1212	254.7	.04	1.4	1.4	380	265	268	57		83	80	3
8	20	1215	256.3	.04	1.4	1.4	381	264	264	56		83	81	3
9	22.5	1217	257.6	.04	1.4	1.4	381	262	263	58		87	81	3
10	25	1220	259.4	.04	1.4	1.4	381	263	263	58		87	81	3
11	27.5	1222	261.1	.04	1.4	1.4	382	264	263	58		88	81	3
12	30	1225	262.9	.04	1.4	1.4	382	265	264	59		88	81	3
1	32.5	1227	264.7	.04	1.4	1.4	~~383~~	265	263	58		~~88~~	~~81~~	3
2	35	1230	266.4	.04	1.4	1.4	395	262	263	62		91	83	3
3	37.5	1232	268.2	.04	1.4	1.4	392	263	264	62		91	83	3
4	40	1235	~~270~~.3	.04	1.4	1.4	391	263	264	63		91	83	3
5	42.5	1237	271.7	.04	1.4	1.4	390	263	264	63		92	83	3
6	45	1240	273.4	.04	1.4	1.4	~~389~~	264	264	63		92	83	3
7	47.5	1242	275.4	.04	1.4	1.4	395	265	266	65		92	84	3
8	50	1245	277.0	.04	1.4	1.4	377	264	264	65		93	84	3
9	52.5	1247	278.8	.04	1.4	1.4	373	264	264	65		93	84	3
10	55	1250	280.5	.04	1.4	1.4	381	263	264	63		93	85	3
11	57.5	1252	282.3	.04	1.4	1.4	382	264	264	63		94	85	3
12	60	1255	~~284~~.046	.04	1.4	1.4	379	264	264	61		94	85	3

ΔVm = 42.446 $\overline{\sqrt{\Delta p}}$ = 0.2 ~~0.1~~ Ave DP = 0.04 $\overline{\Delta H}$ = 1.4 $\overline{Ts}$ = ~~386~~ 380 CS $\overline{Tm}$ = 85

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel Middletown — Run No. C-26-3
Date 9/8/16 — Sample Box No. Sx 1 — Job No. 50074.0172
Sample Location Combustion — Filter No. Quartz
Train Preparer CJ — Sample Head No. 11
Sample Recovery Person DA — Barometer No. TWC
Comments HCl 26 — Balance No. 2

Front Half
Acetone Container No. NA — Liquid Level Marked ____ — Sealed —

Filter Container No. NA — Sealed —

Description of Filter —

Samples Stored and Locked —

Back Half/Moisture
Container No. H_2SO_4 Imp's

Liquid Level Marked ✓ — Sealed —

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	0.1N H_2SO_4	50	693.2	751.9	58.7
2	↓	100	800.0	834.4	34.4
3	↓	100	773.2	779.2	6.0
4	0.1N NaOH	100	777.9	778.5	0.6
5	↓	100	764.0	764.4	0.4
6	SG	250	941.0	950.8	9.8
Total					109.9

Description of Impinger Catch: Clear

$B_{WS} = 11.1\%$

$I_{BD} = 105.1$

HYDROGEN CYANIDE

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: OTM 29 | Operator: EZ | Nozzle ID: ~~0.215~~ 0.195 | Thermocouple #: T3-2

Sampling Location: Baghouse 2 | Pbar: 29.95 | Ps: -1.8 | Assumed Bws: 2.5 | Filter #: Q2-446

Run Number: ~~B-HCN-1~~ 1 | Date: 8/23/16 | CO_2: CEM | O_2: CEM | Meter Box #: 5 | Y: 0.993 | ΔH@: 1.906

Pretest Leak Rate: 0.001 cfm @ 15 in.Hg. | Probe Length/Type: 3' GL | Pitot#: T3-2 | Post-Test Leak Rate: 0.001 cfm @ 8 in.Hg.

Pretest Leak Check: Pitot: √ Orsat: – | Stack Diameter: 35.5" | K: 1.5~~6~~ | Post-Test Leak Check: Pitot: √ Orsat: –

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1021-~~38~~	700.715											
1	3:41	1031-~~35~~	704.773	3.8	5.7	5.7	89	263	260	65	N/A	70	69	4.5
2	7:20	1033-36	708.095	3.1	4.5	4.5	100	261	258	57		70	70	3
3	10:24	1045-49	711.732	3.3	4.9	4.9	101	265	260	58		71	70	3
4	13:48	1113-17	715.497	3.4	5.0	5.0	104	256	260	59		72	72	4
5	17:13	1126-29	719.494	3.6	5.3	5.3	107	260	259	59		73	72	4
port change 6	20:40	1143-46	723.606	3.7	5.4	5.4	111	261	259	59		73	73	4.5
1	23.44	1209-04	727.120	3.3	4.8	4.8	114	255	261	60		74	74	3.5
2	27:09	1219-23	731.046	3.3	4.8	4.8	111	261	249	60		75	75	3.5
3	30:34	1239-43	735.030	3.5	5.1	5.1	111	265	252	59		75	75	4
4														
5														
6	30.57 min													
1														
2														
3														
4														
5														
6														
1														
2														
3														
4														
5														
6														√CJ

ΔVm = 34.315 $\sqrt{\Delta p}$ = 1.8551 $\overline{\Delta H}$ = 5.06 $\overline{Ts}$ = 105 $\overline{Tm}$ = 72

$\overline{\Delta p}$ = 3.4444

EQ Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel Middletown — Run No. P-HCN-1
Date 8/22/16 — Sample Box No. #1 — Job No. 50074.0172
Sample Location Pushing Baghouse - Stack 2 — Filter No. QZ-446
Train Preparer CT — Sample Head No. 12
Sample Recovery Person DA — Barometer No. TWC.com
Comments OTM 29 — Balance No. 2

Front Half
Acetone
Container No. NA — Liquid Level Marked — — Sealed —

Filter
Container No. NA — Sealed —

Description of Filter clean

Samples Stored and Locked

Back Half/Moisture
Container No. 2 - 1st & 2ND Impingers, 3rd Impinger

Liquid Level Marked — Sealed —

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)			pH
			Initial	Final	Net	
1	6N NaOH	100	779.5	781.4	1.9	13.6
2	6N NaOH	100	769.8	772.5	2.7	13.5
3	6N NaOH	100	804.6	805.7	1.1	13.7
4	SG	250	879.6	887.3	7.7	
5			~~879.6~~			
6						
Total					13.4	

-w/cap on

√05

Description of Impinger Catch: Clear

BWS = 1.8%

Iso = 90.96%

EQM

FIELD DATA SHEET

Plant: AK Middletown
Sampling Location: Pushing BH Stack 2
Run Number: P-HCN-2 Date: 8/23/16
Pretest Leak Rate: 0.001 cfm @ 15 in.Hg.
Pretest Leak Check: Pitot: √E Orsat: —

Sample Type: OTM 29 Operator: EZ
Pbar: 29.95 Ps: -1.8
CO_2: CEM O_2: CEM
Probe Length/Type: 3'6L Pitot#: T3-2
Stack Diameter: 35.5" K: 1.56

Nozzle ID: 0.195 Thermocouple #: T3-2
Assumed Bws: 25 Filter #: QZ-447
Meter Box #: 5 Y: 0.993 ΔH@: 1.906
Post-Test Leak Rate: .001 cfm @ 9 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1352	739.358											
1	3:26	1352-56	739.213	3.4	4.9	4.9	121	249	261	61	N/A	77	78	4
2	6:35	1442-46	743.255	3.3	4.8	4.8	114	261	261	60		79	79	4
3	9:47	1452-56	747.736	3.5	5.1	5.1	116	257	260	61		80	79	4
4	13:00	1505-09	751.929	3.6	5.3	5.3	117	260	260	62		80	80	4
5	16:11	1522-25	755.925	3.5	5.1	5.1	118	259	258	61		81	80	4
6	19:16	1540-43	759.898	3.4	4.9	4.9	120	265	260	60		81	81	4
1	22.42	1557-1601	763.742	2.7	3.9	3.9	119	251	255	60		82	81	3
2	26:01	1615-18	767.385	2.7	3.9	3.9	118	256	259	60		82	82	3
3														
4	26.02 minutes													
5														
6														

ΔVm = 32.027 $\overline{\sqrt{\Delta p}}$ = 1.8037 $\overline{\Delta H}$ = 4.74 $\overline{Ts}$ = 118

$\overline{\Delta p}$ = 3.2625

$\overline{Tm}$ = 80

√ DJ

SAMPLE RECOVERY DATA

Plant AK Steel Middletown — Run No. P-HCN-2
Date 8/23/16 — Sample Box No. 13 — Job No. 5270.4.0172
Sample Location Pushers Baghouse Stack 2 — Filter No. CRF-447
Train Preparer CT — Sample Head No. 4
Sample Recovery Person DA — Barometer No. TWC 10M
Comments OTM 2a. HCN — Balance No. 2

Front Half
Acetone
Container No. NA — Liquid Level Marked — — Sealed —

Filter
Container No. Quartz — Sealed ✓

Description of Filter Clean

Samples Stored and Locked ✓

Back Half/Moisture
Container No. 2 1st 2 ND Impingers, 3RD Impgr

Liquid Level Marked ✓ — Sealed —

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	6N NaOH	100	796.0	798.7	2.7
2	6N NaOH	100	740.8	743.0	2.2
3	6N NaOH	100	800.4	800.7	0.3
4	SG	250	909.1	915.0	5.9
5					
6					
Total					11.1

pH
13.0
13.3
13.9

Description of Impinger Catch: Clear

Bws = 1.6 %

I_SO = 102 %

5.1-14

EQM

FIELD DATA SHEET

Plant: AK Middletown Sample Type: HCN/OTM 29 Operator: NP

Sampling Location: P. Baghouse #2 Pbar: 29.97 Ps: -1.1

Run Number: P-HCN-3 Date: 8-24-16 CO_2: ckm O_2: ckm

Pretest Leak Rate: .001 cfm @ 9 in.Hg. Probe Length/Type: 3'GL Pitot#: T3-2

Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 35.5" K: .6558

Nozzle ID: .156 Thermocouple #: T3-2

Assumed Bws: 2.5 Filter #: GF2 ~ 449

Meter Box #: 5 Y: .993 ΔH@: 1.906

Post-Test Leak Rate: .002 cfm @ 8 in.Hg.

Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	1027-	767.757											
1	3:29	1031	770.751	3.4	2.2	2.2	80	265	264	65	NA	72	72	1
2	5:48	1040-1044	773.505	3.0	1.9	1.9	96	265	265	65		74	73	1
3	9:17	1054-1058	776.715	2.7	1.7	1.7	103	266	265	64		75	74	0
4	12:48	1109-1111	778.234	3.0	1.9	1.9	106	268	265	64		76	75	1
5	16:18	1124-1128	780.544	3.0	1.9	1.9	110	266	265	63		77	76	1
6	19:48	1139-1142	782.961	3.1	1.9	1.9	112	265	267	63		78	77	1
1	23:17	1158-1201	785.255	2.7	1.7	1.7	105	266	265	62		78	77	1
2	26:43	1217-1221	787.620	2.6	1.6	1.6	106	263	266	62		77	77	1
3	30.12	1236-1240	790.122	3.3	2.0	2.0	108	269	265	62		78	77	1
4	33:43	1255-1259	792.725	3.0	1.9	1.9	112	260	264	62		78	78	1
5	37:15	1314-1318	795.370	3.4	2.1	2.1	113	263	264	61		78	78	1
6	40.44	1333-1336	798.122	3.3	2.0	2.0	115	256	264	60		79	79	1
1	44:16	1350-1354	800.867	3.1	1.9	1.9	117	259	264	60		80	79	1
2														
3	44.27	minutes												
4														
5														
6														
1														
2														
3														
4														
5														
6														

30.305

ΔVm = 33.110 $\sqrt{\Delta p}$ = 1.7438 $\overline{\Delta H}$ = 1.90 $\overline{Ts}$ = 106 $\overline{Tm}$ = 77

Ave Qf = 3.0462

VJS

SAMPLE RECOVERY DATA

Plant AK Steel - Middletown
Run No. P-HCN-3
Date 8/24/16
Sample Box No. HSB-5
Job No. 5W74.0172
Sample Location Pushing Baghouse Stack #2
Filter No. QZ-449
Train Preparer CJ
Sample Head No. 6
Sample Recovery Person DA
Barometer No. TWC-Com
Comments OTM 29 - HCN
Balance No. 2

Front Half
Acetone
Container No. NA
Liquid
Level Marked —
Sealed —

Filter
Container No. QQ NA
Sealed —

Description of Filter Clean

Samples Stored and Locked —

Back Half/Moisture
Container No. 2 1st; 2ND Impingers; 3RD Impinger

Liquid Level Marked ✓
Sealed —

pH	Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
				Initial	Final	Net
13.3	1	6N NaOH	100	777.0	781.5	4.5
13.6	2	6N NaOH	100	775.6	779.8	4.2
13.7	3	6N NaOH	100	797.0	794.2	-2.8
	4	SG	250	908.8	916.2	7.4
	5					
	6					
	Total					13.3

Description of Impinger Catch: Clear

$B_{WS} = 1.98$

$R_{SO} = 99.1\%$

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: OTM 29 | Operator: NP

Sampling Location: P. Boghouse 2 | Pbar: 30.30 | Ps: -1.1

Run Number: P-HGN-4 | Date: 8-25-16 | CO_2: | O_2:

Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 3' 6" | Pitot#: T3-2

Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: .6558

Nozzle ID: .156 | Thermocouple #: T3-2

Assumed Bws: 1.5 | Filter #: ~~1A~~ QZ-447

Meter Box #: 5 | Y: ~~.993~~ | ΔH@: 1.906

Post-Test Leak Rate: .001 cfm @ 8 in.Hg.

Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	~~3:32~~ 0	1028	801.301											
1	~~203~~ 3:32	1031	803.988	3.3	2.1	2.1	93	265	271	65	NA	79	78	0
2	~~10:34~~ 702	1042-1046	806.581	3.0	1.9	1.9	104	263	262	65		78	78	0
3	10:31	1054-1058	809.432	3.3	2.0	2.0	109	250	266	64		78	78	0
4	14:01	1123-1126	811.948	3.0	1.9	1.9	112	265	269	64		78	78	0
5	17:30	1134-1137	814.372	3.0	1.8	1.8	120	267	265	64		78	78	0
6	20:58	1145-1149	816.798	3.0	1.8	1.8	125	255	261	63		79	79	0
1	24:28	1159-1203	819.363	3.1	1.9	1.9	130	263	265	62		79	79	0
2	27:55	1218-1222	821.876	2.9	1.7	1.7	132	270	260	62		80	79	0
3	31:30	1238-1241	824.397	3.0	1.8	1.8	135	270	265	62		80	80	0
4	35:03	1257-1300	827.022	2.7	1.7	1.7	120	265	265	63		81	80	0
5	38:34	1316-1319	829.675	3.2	1.9	1.9	127	266	267	63		81	80	0
6	42:02	1335-1338	832.243	3.2	1.9	1.9	130	266	265	64		82	81	0
1	45:32	1350-1354	834.810	3.0	1.8	1.8	135	254	264	63		83	82	0
2														
3														
4														
5														
6														
1														
2														
3														
4														
5														✓ 0.5
6														

5.497

23.090

28.374

ΔVm = 33.509 $\sqrt{\Delta p}$ = 1.7470 ΔH = 1.86 Ts = 121 Tm = 79

Ave Dn = 3.0538

150 = 99.6

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel Mrddletown Run No. P-HCN-4
Date 8/25/16 Sample Box No. 13 Job No. 5274-0172
Sample Location ~~AK Mrs~~ Pressure BH Filter No. Quartz
Train Preparer DA Sample Head No. 12
Sample Recovery Person CS Barometer No. TWC. Con
Comments Other Method 29 - HCN Balance No. 2

Front Half
Acetone Liquid
Container No. _____ Level Marked _____ Sealed _____

Filter
Container No. _____ Sealed _____

Description of Filter _____

Samples Stored and Locked _____

Back Half/Moisture
Container No. (2) 1ST & 2ND IMPINGERS
3RD IMPINGER
Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	6N $NaOH$	100	796.0	809.8	13.8
2	6N $NaOH$	100	740.0	748.9	8.9
3	6N $NaOH$	100	805.9	797.7	-8.2
4	SG	200	915.0	922.4	7.4
5					
6					
Total					21.9

pH
13.0
13.2
12.9

Description of Impinger Catch: clear

✓E2 Bws = 3.0%

EQM

FIELD DATA SHEET

Plant: AK Middletown　　Sample Type: HCN/OTM 29　Operator: NP　　Nozzle ID: .156　Thermocouple #: T3-2

Sampling Location: P. Baghouse 2　　Pbar: ______　Ps: ______　　Assumed Bws: ____　Filter #: ______

Run Number: P-HCN-FB　Date: 8-25-16　　CO_2: ______　O_2: ______　　Meter Box #: 11　Y: .993　ΔH@: 1.793

Pretest Leak Rate: .001 cfm @ 10 in.Hg.　　Probe Length/Type: 3' 6L　Pitot#: T3-2　　Post-Test Leak Rate: .001 cfm @ 10 in.Hg.

Pretest Leak Check: Pitot: ✓c　Orsat: —　　Stack Diameter: 35.5"　K: ______　　Post-Test Leak Check: Pitot: ____　Orsat: ____

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	

$\Delta Vm =$ ______　$\overline{\sqrt{\Delta p}} =$ ______　$\overline{\Delta H} =$ ______　$\overline{Ts} =$ ______　$\overline{Tm} =$ ______

SAMPLE RECOVERY DATA

Plant AK Steel Middletown — Run No. P-HCN-FB
Date 8/11/16 — Sample Box No. 11 — Job No. 20074.0172
Sample Location PRESSURE BAGHOUSE — Filter No. Quartz
Train Preparer DA — Sample Head No. 12
Sample Recovery Person CJ — Barometer No. PVC.com
Comments OSM 29 - HCN — Balance No. 2

Front Half
Acetone — Liquid
Container No. _____ Level Marked _____ Sealed _____

Filter
Container No. _____ Sealed _____

Description of Filter _____

Samples Stored and Locked _____

Back Half/Moisture
Container No. 1ST & 2ND IMPINGER / 3RD IMPINGER

Liquid Level Marked ✓ Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)			pH
			Initial	Final	Net	
1	6N NaOH	100	780.1	780.0	-0.1	13.76
2	6N NaOH	100	781.7	781.7	0.0	13.85
3	6N NaOH	100	804.8	804.7	-0.1	13.78
4	SG	250	887.3	887.6	0.3	
5						
6						
Total					0.1 ✓	

Description of Impinger Catch: clear

EQM

HCN OTM-29 FIELD DATA SHEET

Plant: AK Steel | Sample Type: Cyanide | Operator: RH | Nozzle ID: 0.500 | Thermocouple #: TS-2
Sampling Location: Carbon Thm Stack | Pbar: 30.20 | Ps: -0.75" | Assumed Bws: 10 | Filter #: QZ447
Run Number: C-OTM29-1 | Date: 9/6/16 | CO_2: 3 | O_2: 15 | Meter Box #: 3 | Y: 1.009 | ΔH@: 1.890
Pretest Leak Rate: 0.002 cfm @ 12 in.Hg. | Probe Length/Type: 6' 6L | Pitot#: PS-2 | Post-Test Leak Rate: 0.001 cfm @ 6 in.Hg.
Pretest Leak Check: Pitot: √± Orsat: — | Stack Diameter: 168" | K: ~~59.~~ 59.452 | Post-Test Leak Check: Pitot: √± Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	1450	916.214											
1	2.5	1452	918.2	0.04	1.7	1.7	296	248	254	68		94	93	1
2	5.0	1455	920.0	0.04	1.8	1.8	290	249	253	67		92	92	1
3	7.5	1457	922.0	0.04	1.8	1.8	270	245	251	60		92	92	1
4	10.0	1500	923.6	0.04	1.8	1.8	260	240	251	57		93	92	1
5	12.5	1502	925.3	0.035	1.6	1.6	260	248	251	57		95	92	1
6 *	15.0	1505	927.210	0.040	1.8	1.8	270	249	250	57		96	92	1
7	17.5	1507	929.0	0.040	1.8	1.8	283	252	251	58		94	92	1
8	20.0	1520	930.85	0.040	1.8	1.8	286	249	250	61		94	92	1
9	22.5	1522	932.7	0.040	1.8	1.8	290	249	251	60		95	92	1
10	25.0	1525	934.6	0.040	1.8	1.8	292	250	250	58		96	92	1
11	27.5	1527	936.4	0.035	1.5	1.5	293	247	250	59		97	92	1
12	30.0	1530	938.180	0.050	2.2	2.2	292	250	250	61		97	92	1
1533 1	32.5	1535	940.1	0.040	1.8	1.8	300	249	249	62		93	92	1
2	35.0	1537	941.7	0.035	1.5	1.5	302	246	249	63		96	92	1
3	37.5	1540	943.4	0.035	1.5	1.5	300	244	249	63		97	92	1
4	40.0	1542	945.2	0.040	1.8	1.8	297	245	250	63		97	92	1
5	42.5	1545	947.1	0.040	1.8	1.8	298	246	251	62		97	92	1
6	45.0	1547	948.9	0.040	1.8	1.8	295	250	250	62		97	92	1
End 7	47.5	1550	950.570	0.035	1.5	1.5	292	248	250	63		98	92	1
8	50.0													
9	52.5													
10	55.0													
11	57.5													
12	60.0													

* Pause 1515

$\Delta Vm = 34.350\sqrt{\Delta p} = \frac{0.1978}{0.0792}$ $\overline{\Delta H} = 1.74$ $\overline{Ts} = 288$ $\overline{Tm} = 93.5$

950 = 98.8 (NP)

L951.2

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel Middletown — Run No. C-HCN-1
Date 9/6/11 — Sample Box No. ____ — Job No. 5074.0172
Sample Location Carbon Stack — Filter No. QZ 447
Train Preparer CJ — Sample Head No. SH-2
Sample Recovery Person GJ — Barometer No. 1
Comments HCN train — Balance No. 1

Front Half
Acetone
Container No. N/A — Liquid Level Marked ✓ — Sealed ✓

Filter
Container No. N/A — Sealed ✓

Description of Filter —

Samples Stored and Locked —

Back Half/Moisture
Container No. 1ST & 2ND IMPINGER / 3RD IMPINGER

Liquid Level Marked ✓ — Sealed ✓

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)			pH
			Initial	Final	Net	
1	6 N NaOH	100	776.6	776.7	30.1	13.3
2	↓	↓	791.3	802.8	11.5	12.8
3	↓	↓	796.6	808.7	12.1	13.0
4	SG	250	922.4	929.9	7.5	
5						
6						
Total					61.2	

Description of Impinger Catch: 1st imp yellowish, 2 & 3 are clear

Bws = 7.9%

NP

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: HCN | Operator: EZ
Sampling Location: Combustion Stack | Pbar: 30.00 | Ps: -0.98
Run Number: CS-HCN-2 | Date: 9-8-16 | CO_2: CEM | O_2: CEM
Pretest Leak Rate: 0.001 cfm @ 15 in.Hg. | Probe Length/Type: 5' GL | Pitot#: TS-2
Pretest Leak Check: Pitot: ✓ Orsat: — | Stack Diameter: 168" | K: 51.66

Nozzle ID: 0.483 | Thermocouple #: TS-2
Assumed Bws: 10 | Filter #: Untared Q2
Meter Box #: 3 | Y: 1.009 | ΔH@: 1.890
Post-Test Leak Rate: .001 cfm @ 10 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	1008	107.144											
1	2.5	1010	109.6	0.07	2.5	2.5	310	251	260	65	N/A	74	73	2
2	5	1013	111.5	0.06	2.2	2.2	297	248	255	63		74	73	2
3	7.5	1015	113.6	0.07	2.5	2.5	303	248	253	59		75	74	2
4	10	1018	115.7	0.07	2.5	2.5	299	250	252	58		77	74	2
5	12.5	1020	117.3	0.04	1.4	1.4	308	250	252	59		79	75	2
6	15	1023	118.8	0.04	1.4	1.4	302	251	250	59		80	75	1
7	17.5	1025	120.3	0.04	1.3	1.3	384	253	250	59		80	75	1
8	20	1028	121.6	0.03	0.98	0.98	390	253	250	60		81	76	1
9	22.5	1030	123.0	0.03	0.98	0.98	392	251	250	61		82	76	1
10	25	1033	124.3	0.03	0.98	0.98	393	250	250	61		82	77	1
11	27.5	1035	125.6	0.03	0.98	0.98	396	250	250	61		83	77	1
12	30	1038	126.9	0.03	0.98	0.98	396	249	250	61		83	78	1
1	32.5	1040	128.5	0.04	1.4	1.4	367	250	250	59		84	78	1
2	35	1043	129.9	0.03	1.0	1.0	365	251	250	55		85	78	1
3	37.5	1045	131.2	0.03	1.0	1.0	367	251	250	52		86	79	1
4	40	1048	132.6	0.03	1.0	1.0	368	250	249	51		86	79	1
5	42.5	1050	133.9	0.03	1.0	1.0	370	250	251	50		87	80	1
6	45	1053	135.3	0.03	1.0	1.0	372	250	250	50		87	80	1
7	47.5	1055	136.7	0.03	1.0	1.0	373	251	250	50		87	81	1
8	50	1058	138.0	0.03	1.0	1.0	374	249	250	50		88	81	1
9	52.5	1100	139.4	0.03	1.0	1.0	376	249	250	50		88	81	1
10	55	1103	140.7	0.03	1.0	1.0	376	250	250	50		89	82	1
11	57.5	1105	141.7	0.02	0.67	0.67	379	250	250	51		89	82	1
12	60	1108	142.425	0.02	0.67	0.67	371	249	251	52		89	83	1

$\Delta Vm =$ 34.981 $\sqrt{\Delta p} =$ 0.1894 $\overline{\Delta H} =$ 1.27 $\overline{Ts} =$ 360 $\overline{Tm} =$ 80

$\overline{\Delta p} = 0.0371$

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel
Date 9/8/16 Sample Box No. —
Sample Location Combustion Stack
Train Preparer CJ/PK
Sample Recovery Person DA
Comments OTM 29

Run No. C-HCN 2
Job No. 5W74-0172
Filter No. Quartz
Sample Head No. 6
Barometer No. TWC
Balance No. 2

Front Half
Acetone
Container No. NA Liquid Level Marked — Sealed —

Filter
Container No. NA Sealed —

Description of Filter —

Samples Stored and Locked —

Back Half/Moisture
Container No. 1ST & 2ND Impinger & 3RD Impinger

Liquid Level Marked — Sealed —

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)			pH
			Initial	Final	Net	
1	6 N NaOH	100	739.3	816.3	77.0	13
2	6 N NaOH	100	799.8	822.9	23.1	13.2
3	6N NaOH	100	796.7	803.6	6.9	13.5
4	SG	250	929.8	936.3	6.5	
5						
6						
Total					113.5	

Description of Impinger Catch: Yellowish - 1st Impinger

$M_{ws} = 13.32$

$I_{SO} = 100.216$

NP

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: OTM 29 | Operator: EZ | Nozzle ID: 0.483 | Thermocouple #: T5-2

Sampling Location: ~~Baghouse Stack~~ Comb. Stack | Pbar: 30.00 | Ps: -0.93 | Assumed Bws: 10 | Filter #: untared Q2

Run Number: CS-HCN-3 | Date: 9/8/16 | CO_2: CEM | O_2: CEM | Meter Box #: 3 | Y: 1.009 | ΔH@: 1.890

Pretest Leak Rate: 0.002 cfm @ 15 in.Hg. | Probe Length/Type: 5'/L | Pitot#: T5-2 | Post-Test Leak Rate: 0.001 cfm @ 1 in.Hg.

Pretest Leak Check: Pitot: √ Orsat: — | Stack Diameter: 168" | K: 51.66 | Post-Test Leak Check: Pitot: √ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1155	142.800											
1	2.5	1157	144.4	0.04	1.3	1.3	373	249	253	65	N/A	83	82	1
2	5	1200	145.9	0.04	1.3	1.3	375	252	254	62		82	82	1
3	7.5	1202	147.5	0.04	1.3	1.3	377	252	254	60		83	82	1
4	10	1205	149.0	0.04	1.3	1.3	378	250	251	60		84	81	1
5	12.5	1207	150.5	0.04	1.3	1.3	370	249	251	59		85	82	1
6	15	1210	152.0	0.04	1.3	1.3	376	251	251	59		86	82	1
1	17.5	1212	153.5	0.04	1.3	1.3	378	248	249	61		87	83	1
2	20	1215	154.8	0.03	1.0	1.0	380	250	249	61		88	83	1
3	22.5	1217	156.2	0.03	1.0	1.0	384	251	250	61		89	83	1
4	25	1220	157.5	0.03	1.0	1.0	386	250	251	62		89	83	1
5	27.5	1222	158.8	0.03	1.0	1.0	388	249	251	63		89	84	1
6	30	1225	160.2	0.03	1.0	1.0	390	250	250	63		90	84	1
1	32.5	1227	161.5	0.03	1.0	1.0	391	249	249	63		90	84	1
2	35	1230	162.6	0.02	0.66	0.66	393	250	249	63		90	84	1
3	37.5	1232	163.8	0.02	0.66	0.66	394	250	251	64		90	85	1
4	40	1235	165.1	0.03	1.0	1.0	397	250	251	65		90	85	1
5	42.5	1237	166.5	0.03	1.0	1.0	397	251	250	65		91	85	1
6	45	1240	167.9	0.03	1.0	1.0	367	250	250	64		92	85	1
1	47.5	1242	169.4	0.03	0.69	0.69	367	250	251	63		92	86	1
2	50	1245	170.6	0.02	0.69	0.69	367	251	250	63		92	86	1
3	52.5	1247	171.7	0.02	0.69	0.69	369	250	250	64		92	86	1
4	55	1250	172.8	0.02	0.69	0.69	370	250	250	64		92	86	1
5	57.5	1252	174.2	0.03	1.0	1.0	372	250	249	64		92	87	1
6	60	1255	175.764	0.04	1.4	1.4	373	250	250	64		93	87	1

ΔVm = 32.964 $\overline{\sqrt{\Delta p}}$ = 0.1742 $\overline{\Delta H}$ = 1.02 $\overline{Ts}$ = 380 $\overline{Tm}$ = 86

$\overline{\Delta p}$ = 0.0308

NP

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel - Middletown
Run No. C-HCN-3
Date 9/8/16
Sample Box No. HSD-5
Job No. 5W74.0172
Sample Location Combustion Stack
Filter No. Quartz
Train Preparer DA
Sample Head No. 6
Sample Recovery Person DA
Barometer No. TWC.com
Comments OTM 29 - HCN
Balance No. 2

Front Half
Acetone
Container No. NA
Liquid
Level Marked _____
Sealed —

Filter
Container No. NA
Sealed —

Description of Filter —

Samples Stored and Locked _____

Back Half/Moisture
Container No. 1st; 2ND Imps; 3RD Imp

Liquid Level Marked —
Sealed —

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)			
			Initial	Final	Net	
1	6N NaOH	100	777.7	854.9	77.7	13
2	6N NaOH	100	772.0	792.5	20.5	13.1
3	6N NaOH	100	807.7	811.4	3.7	13.5
4	SG	250	916.2	921.7	5.5	
5						
6						
Total					106.9	

pH

Description of Impinger Catch: @ Yellowish 1st Imp's

BWS = 13.5%

Fso = 102.8%

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel Middletown — Run No. C-HCN-FB
Date 9/8/16 — Sample Box No. 13 — Job No. 5207A-0172
Sample Location Combustion Stack — Filter No. Quartz
Train Preparer DA — Sample Head No. 2
Sample Recovery Person DA — Barometer No. TWC
Comments OTM 29 HCN — Balance No. 2

Front Half
Acetone
Container No. NA — Liquid Level Marked — — Sealed —

Filter
Container No. NA — Sealed —

Description of Filter —

Samples Stored and Locked —

Back Half/Moisture
Container No. 1ST & 2ND Imps; 3RD Imp

Liquid Level Marked ✓ — Sealed —

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)			pH
			Initial	Final	Net	
1	6N NaOH	100	779.8	779.6	-.2	13.2
2	"	100	791.7	791.5	-.2	13.2
3	"	100	782.9	782.8	-.3	13.3
4	Si	250	936.3	935.8	-.5	
5						
6						
Total					-1.2	

Description of Impinger Catch: Clear

NP

SEMI-VOLATILE ORGANIC HAP

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: D/F/Carb | Operator: GD | Nozzle ID: .156 | Thermocouple #: T3-1
Sampling Location: Baghouse #3 | Pbar: 30.20 | Ps: -2.0 | Assumed Bws: 1.8 | Filter #: UNTARED
Run Number: P-Carb-1 | Date: 9-12-16 | CO_2: 0.5 | O_2: 20.5 | Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783
Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 3' GI | Pitot#: T3-1 | Post-Test Leak Rate: .001 cfm @ 8 in.Hg.
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: .6096 | Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1026	358.286											
1	3:11	1029	360.643	3.2	1.8	1.8	95	262	265	65	64	63	63	5.0
2	6:31	1045-1048	363.119	3.1	1.8	1.8	99	258	259	60	61	63	63	5.0
3	9:43	1102-1105	365.476	3.0	1.7	1.7	106	259	259	57	59	63	63	5.0
4	12:57	1116-1119	367.897	2.9	1.6	1.6	110	258	260	58	59	65	64	5.0
5	16:20	1136-1139	370.194	2.8	1.6	1.6	112	260	260	59	58	66	65	5.0
6	19:45	1151-1154	372.582	3.0	1.7	1.7	114	253	253	60	58	67	67	5.0
1	23:00	1201-1204	374.841	3.0	1.7	1.7	116	258	258	57	59	68	67	5.0
2	26:29	1221-1224	377.476	3.1	1.7	1.7	113	259	255	57	60	70	69	5.0
3	29:47	1238-1241	379.943	3.1	1.7	1.7	115	257	261	58	61	71	70	5.5
4	33:05	1257-1300	382.363	3.0	1.7	1.7	116	259	257	56	59	72	71	5.5
5	36:30	1316-1319	384.941	3.2	1.8	1.8	114	261	264	57	59	73	72	5.5
6	39:46	1336-1339	387.317	3.0	1.7	1.7	115	259	265	58	59	74	73	5.5
1	43:06	1350-1354	389.861	3.1	1.8	1.8	116	262	260	57	58	74	73	5.5
2	46:16	1439-1442	392.138	2.8	1.6	1.6	118	258	260	60	56	74	74	5.0
3	49:30	1451-1454	394.518	2.8	1.6	1.6	120	257	257	58	55	74	74	5.0
4	52:46	1507-1510	396.903	2.9	1.6	1.6	115	252	261	57	53	75	74	5.0
5	56:04	1524-1528	399.355	3.0	1.7	1.7	119	252	256	59	54	75	75	5.0
6	59:25	1542-1545	401.855	3.1	1.8	1.8	112	257	256	58	54	75	75	5.5
1	62:53	1559-1602	404.429	3.1	1.8	1.8	115	254	258	58	56	75	75	5.5
2	66:16	1616-1619	407.016	3.4	1.9	1.9	117	260	264	59	55	75	75	6.0
3	69:40	1634-1637	409.623	3.4	1.9	1.9	118	259	260	58	55	75	75	6.0
4	73:04	1651-1655	412.181	3.2	1.8	1.8	122	261	259	57	53	75	75	6.0
5	76:55	1709-1713	415.024	3.3	1.8	1.8	124	257	262	58	54	75	75	6.0
6	80:16	1725-1728	417.702	3.3	1.9	1.9	115	262	259	59	52	75	75	6.0
1	83:35	1738-1741	420.315	3.4	1.9	1.9	113	262	261	57	53	75	75	6.0

Port Change

ΔVm = 62.029 | $\overline{\sqrt{\Delta p}}$ = _____ | $\overline{\Delta H}$ = _____ | $\overline{Ts}$ = _____ | $\overline{Tm}$ = _____

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: CARB 428/429 | Operator: DA | Nozzle ID: 0.156 | Thermocouple #: T3-1

Sampling Location: Peaking Baghouse #3 | Pbar: 30.20 | Ps: -1.6 | Assumed Bws: 1.8 | Filter #: unnumbered

Run Number: P-CARB-1 | Date: 9/12-13/16 | CO_2: 0.5 | O_2: 20.5 | Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783

Pretest Leak Rate: .02 cfm @ 8 in.Hg. | Probe Length/Type: 3'6" | Pitot#: T3-1 | Post-Test Leak Rate: 0.003 cfm @ 8 in.Hg.

Pretest Leak Check: Pitot: ✓ Orsat: NA | Stack Diameter: 35.5" | K: 0.6096 | Post-Test Leak Check: Pitot: ✓ Orsat: NA

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
	After Leak Check		420.417											
2	86:45	2222-2226	425.086	3.3	1.9	1.9	90	262	260	69	43	69	70	5.5
3	90:00	2232-2237	425.486	3.1	1.8	1.8	91	260	261	62	43	69	69	6
4	93:20	2244-2248	428.045	3.1	1.8	1.8	100	256	260	61	44	69	69	6
5	96:45	2305-2308	430.649	3.1	1.8	1.8	98	240	260	56	44	68	69	6
6	100:05	2323-2326	433.224	3.1	1.8	1.8	97	241	258	58	42	68	69	6
1	103:30	2342-2345	435.833	3.1	1.8	1.8	95	240	259	53	42	67	68	6
2	107:00	0003-0007	438.395	3.2	1.9	1.9	93	236	257	56	42	67	68	6
3	110:30	0019-0023	441.131	3.2	1.9	1.9	92	241	266	53	43	67	68	6
4	114:00	0038-0042	443.640	3.2	1.9	1.9	90	245	258	58	43	66	67	6
5	117:30	0057-101	446.268	3.1	1.8	1.8	97	234	258	53	43	66	66	6
6	121:00	0116-0119	448.809	3.1	1.8	1.8	102	237	260	53	45	66	66	6
1	124:15	0135-0138	451.352	3.1	1.8	1.8	97	243	263	55	49	66	66	6
2	127:30	0145-0149	453.896	3.2	1.9	1.9	91	242	262	55	49	66	67	6
3	131:00	0249-0253	456.580	3.2	1.9	1.9	90	261	260	61	51	66	66	6
4	134:15	0300-303	459.085	3.2	1.9	1.9	89	241	258	57	52	66	67	6
5	137:30	310-313	461.637	3.2	1.9	1.9	91	234	259	58	53	67	67	6
6	140:45	327-331	464.185	3.2	1.9	1.9	92	238	251	59	54	68	67	6
1	144:00	342-345	466.738	3.2	1.9	1.9	93	235	257	58	54	68	67	6
2	147:15	357-400	469.326	3.2	1.9	1.9	96	239	260	59	54	69	68	6
3	150:30	416-419	471.870	3.1	1.8	1.8	100	233	260	59	55	71	69	6
4	153:45	433-437	474.400	3.1	1.8	1.8	104	231	259	60	56	72	70	6
5	157:00	451-454	476.958	3.1	1.8	1.8	100	238	261	59	56	73	71	6
6	160:15	508-512	479.422	3.1	1.8	1.8	99	237	256	60	57	74	73	6
1	163:30	525-528	481.920	3.1	1.8	1.8	96	237	256	60	57	75	74	6
2	166:45	535-538	484.485	3.1	1.8	1.8	93	245	256	61	57	76	75	6

.102 leak check

$\Delta Vm = 64.068 \sqrt{\Delta p} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

EQM

FIELD DATA SHEET

pg 3 of 3

Plant: AK Middletown Sample Type: Δ/F Carb 428-429 Operator: GD Nozzle ID: .156 Thermocouple #: T3-1
Sampling Location: P. Baghouse #3 Pbar: 30.15 Ps: -1.9 Assumed Bws: 1.8 Filter #: Untared
Run Number: P-Carb-1 Date: 9-13-16 CO_2: 0.5 O_2: 20.5 Meter Box #: 13 Y: 0.989 ΔH@: 1.783
Pretest Leak Rate: .001 cfm @ 8 in.Hg. Probe Length/Type: 3' GI Pitot#: T3-1 Post-Test Leak Rate: .001 cfm @ 10 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: – Stack Diameter: 35.5" K: 0.6096 Post-Test Leak Check: Pitot: ✓ Orsat: –

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	166:45	~~166:45~~ 1036	484.681											
3	169:58	1039	487.130	3.3	1.9	1.9	98	260	261	64	59	64	64	6.0
4	173:15	1049-1052	489.604	3.2	1.8	1.8	107	256	256	60	54	67	66	6.0
5	176:30	1102-1105	492.028	3.2	1.8	1.8	113	263	265	58	52	68	67	6.0
6	179:36	1116-1120	494.514	3.1	1.7	1.7	115	261	260	57	51	69	69	6.0
1	182:50	1130-1133	497.056	3.1	1.7	1.7	119	264	259	59	50	71	70	6.0
2	185:56	1141-1144	499.390	3.3	1.8	1.8	120	260	261	58	50	73	71	6.0
3	189:09	1158-1201	501.804	3.2	1.8	1.8	118	260	263	57	49	73	72	6.0
4	192:26	1217-1220	504.237	3.3	1.9	1.9	113	262	257	58	49	73	73	6.0
~~5~~														
~~6~~														

.196 leak check

Final → ΔVm = 145.653 $\sqrt{\Delta p}$ = 1.7691 $\overline{\Delta H}$ = 1.79 $\overline{Ts}$ = 106 $\overline{Tm}$ = 70

$\overline{\Delta P}$ = 3.1310

-.298 Leak checks

✓BF

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/12-9/13/16 Sample Box No. 6
Sample Location Rushing Bagasse Outlet
Train Preparer NR
Sample Recovery Person AL/BF
Comments CARB

Run No. P-CARB-1
Job No. 5007Y.0172
Filter No. Untared Quartz
Sample Head No. 8
Barometer No. 1
Balance No. 1

Front Half
Acetone Liquid
Container No. P-CARB-1 Level Marked ✓ Sealed ✓

Filter
Container No. ~~Outlook~~ P-CARB-1 Sealed ✓

Description of Filter ~~light~~ white

Samples Stored and Locked ✓

Back Half/Moisture
Container No. NA

Liquid Level Marked NA Sealed NA

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	—	—	488.2	510.0	21.8
2	H_2O	100	767.7	762.7	-5.0
3	—	—	689.3	690.0	0.7
4	Silica	250	941.4	973.2	31.8
5					
6					
Total					49.3

Description of Impinger Catch: clear

EQM

FIELD DATA SHEET pg. 1 of 3

Plant: AK Middletown
Sampling Location: P. Baghouse # 3
Run Number: P-Carb-2 Date: 9-13-16
Pretest Leak Rate: .001 cfm @ 9 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: —

Sample Type: D/F Carb 4z5/429 Operator: GD / DA
Pbar: 30.15 Ps: -1.8
CO_2: 0.5 O_2: 20.5
Probe Length/Type: 3' G1 Pitot#: T3-1
Stack Diameter: 35.5 K: 0.6096

Nozzle ID: .156 Thermocouple #: T3-1
Assumed Bws: 1.8 Filter #: UNTARED
Meter Box #: 13 Y: 0.989 ΔH@: 1.783
Post-Test Leak Rate: .001 cfm @ 8 in.Hg.
Post-Test Leak Check: Pitot: ✓2 Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	1339	504.820											
1	3:13	1342	507.174	3.1	1.8	1.8	110	257	253	62	54	74	74	4.0
2	6:27	1429-1433	509.507	2.9	1.6	1.6	118	255	264	60	51	76	75	4.0
3	9:46	1439-1442	512.056	2.9	1.6	1.6	117	259	259	57	50	76	76	4.0
4	13:05	1457-1500	514.388	2.9	1.6	1.6	118	262	262	54	48	76	76	4.0
5	16:24	1521-1524	516.752	2.9	1.6	1.6	121	256	262	55	48	78	78	4.0
6	19:51	1532-1536	519.151	3.0	1.7	1.7	116	261	262	54	49	79	78	4.5
1	23:17	1550-1553	521.646	2.9	1.6	1.6	120	258	259	52	49	79	79	5.0
2	26:30	1605-1608	523.946	3.0	1.7	1.7	123	257	257	53	48	80	79	4.5
3	29:48	1620-1624	526.308	3.0	1.7	1.7	119	260	255	54	49	80	80	5.0
4	33:05	1641-1645	528.483	3.1	1.8	1.8	114	263	257	55	50	80	80	4.5
5	36:23	1651-1654	530.875	3.0	1.7	1.7	120	257	255	57	46	80	80	5.0
6	39:38	1700-1703	533.514	3.0	1.7	1.7	125	254	263	58	45	80	80	5.5
1	42:50	1709-1712	536.012	3.0	1.7	1.7	123	263	256	57	44	80	79	5.0
2	46:13	1721-1724	538.488	2.8	1.6	1.6	116	260	263	58	45	80	79	5.0
3	49:23	1730-1733	541.017	2.8	1.6	1.6	112	263	258	57	44	79	79	5.5
4	53:30	2232-2236	544.228	2.9	1.7	1.7	95	264	266	68	55	70	70	5.5
5	57:00	2244-2248	546.780	2.9	1.7	1.7	95	257	265	64	57	71	71	5
6	60:30	2303-2306	549.273	3.0	1.7	1.7	103	261	264	64	58	73	72	5
1	63:45	2322-2326	551.676	3.0	1.7	1.7	96	258	259	65	60	74	73	5
2	67:15	2341-2345	554.264	2.9	1.7	1.7	97	256	263	59	45	75	74	5
3	70:45	00:00-0004	556.843	2.9	1.7	1.7	111	253	260	57	47	76	75	5
4	74:00	0019-0022	559.271	3.0	1.7	1.7	100	259	260	59	51	76	75	5
5	77:30	0040-0044	561.925	3.1	1.8	1.8	105	259	266	61	54	76	76	5
6	80:45	0058-01:00	564.466	3.1	1.8	1.8	102	255	250	60	56	76	76	6

41.139

Leak Check = .122

Page 1 ΔVm = 59.524 $\overline{\sqrt{\Delta p}}$ = ______ $\overline{\Delta H}$ = ______ $\overline{Ts}$ = ______ $\overline{Tm}$ = ______

EQM→

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: CARB 428/429 | Operator: DA / GD | Nozzle ID: 0.156 | Thermocouple #: T3-1
Sampling Location: Rolling Baghouse #3 | Pbar: 30.15 | Ps: -1.8 | Assumed Bws: 18 | Filter #: untared
Run Number: R-CARB-2 | Date: 9-14-16 | CO_2: 0.5 | O_2: 20.5 | Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783
Night Crew Leak Check — Pretest Leak Rate: 0.002 cfm @ 8 in.Hg. | Probe Length/Type: 3'G1 | Pitot#: T3-1 | Post-Test Leak Rate: .001 cfm @ 7 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: NA | Stack Diameter: 35.5 | K: 0.6096 | Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
	From Page 1		564.466											
1	84:00	0116 0119	567.027	2.9	1.7	1.7	101	262	255	62	57	77	76	5
2	87:30	0135 0139	569.695	2.9	1.7	1.7	99	259	260	62	58	76	76	5
3	90:45	0145 0148	572.211	3.1	1.8	1.8	101	251	263	63	60	76	76	5
4	94:00	0247 0250	574.627	2.9	1.7	1.7	101	259	251	63	60	77	76	5
5	97:15	0258 0301	577.139	3.0	1.8	1.8	95	257	250	63	62	74	75	5
6	100:30	0308 0311	579.632	3.0	1.8	1.8	95	262	265	63	63	75	75	5
1	103:45	0324 0327	582.092	2.9	1.7	1.7	98	253	267	64	63	75	75	5
2	107:00	0342 0345	584.617	3.0	1.8	1.8	96	263	261	64	64	75	75	5
3	110:15	0359 0403	587.048	3.0	1.8	1.8	98	263	258	59	50	75	75	5
4	113:30	0416 0420	589.479	2.9	1.7	1.7	95	255	255	57	57	74	74	4.5
5	116:45	0433 0436	591.976	3.1	1.8	1.8	92	258	257	59	53	74	74	5
6	120:00	0451 0455	594.366	2.9	1.7	1.7	96	261	264	58	55	74	74	4.5
1	123:15	0508 0512	596.826	3.0	1.8	1.8	96	265	261	60	56	73	74	5
2	126:30	0525 0528	599.271	3.0	1.8	1.8	94	265	261	60	57	73	73	5
3	129:45	0535 0538	601.655	3.0	1.8	1.8	93	257	255	60	58	73	73	5
4	133:03	1017-1021	604.248	3.1	1.8	1.8	97	252	260	58	51	70	69	5.0
5	136:25	1028-1031	606.702	3.2	1.8	1.8	100	254	264	56	48	71	70	5.5
6	139:39	1043-1046	609.000	3.3	1.9	1.9	108	257	259	58	48	73	72	5.0
1	142:54	1105-1108	611.318	2.9	1.7	1.7	110	254	260	57	47	73	73	5.0
2	146:14	1120-1124	613.716	3.0	1.7	1.7	112	254	258	58	48	74	74	5.0
3	149:34	1137-1141	616.146	2.9	1.6	1.6	118	260	257	59	50	75	74	5.0
4	152:55	1157-1200	618.556	3.0	1.7	1.7	117	263	258	58	49	75	75	5.0
5	155:47	1216-1219	620.500	2.8	1.6	1.6	126	260	256	57	49	77	76	5.0
6	159:07	1235-1238	622.946	3.1	1.7	1.7	125	254	256	56	48	77	77	5.0

New volume 601.748
Leak check volume
-0.093
NEW VOLUME 601.817
-.162

TOTAL Leak Checks -.284

ΔVm = 117.842 $\sqrt{\Delta p}$ = _____ $\overline{\Delta H}$ = _____ $\overline{Ts}$ = _____ $\overline{Tm}$ = _____

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: D/F carb 428/429 | Operator: GD
Sampling Location: P. Baghouse #3 | Pbar: 30.21 | Ps: -1.8
Run Number: P-Carb-2 | Date: 9-14-16 | CO_2: 0.5 | O_2: 20.5
Pretest Leak Rate: .001 cfm @ 7 in.Hg. | Probe Length/Type: 3' G1 | Pitot#: T3-1
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: 0.6096

Nozzle ID: .156 | Thermocouple #: T3-1
Assumed Bws: 1.8 | Filter #: Untared
Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783
Post-Test Leak Rate: .001 cfm @ 8 in.Hg.
Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	154:07	1235-1238	622.946											
1	162:24	1254-1257	625.392	3.0	1.7	1.7	125	261	256	58	50	78	78	5.5
2	165:36	1313-1316	627.789	3.1	1.8	1.8	122	255	256	59	51	79	79	5.5
3	168:53	1325-1328	630.194	3.1	1.8	1.8	108	253	257	58	50	80	79	5.0
4	172:11	1424-1438	632.711	3.1	1.8	1.8	99	260	264	57	49	78	78	5.0
5	175:27	1434-1438	635.118	3.1	1.8	1.8	110	255	261	56	48	78	78	5.0
6	178:43	1448-1452	637.528	3.2	1.8	1.8	113	263	257	58	49	78	78	5.5
1	182:00	1504-1507	640.096	3.2	1.8	1.8	114	259	263	59	49	78	78	5.5
2	185:18	1522-1525	642.424	3.2	1.8	1.8	116	256	257	59	49	79	78	5.5
3	188:29	1547-1551	645.028	3.1	1.8	1.8	117	263	265	60	50	79	79	6.0
4	191:47	1558-1601	647.645	3.1	1.8	1.8	116	255	262	59	49	79	79	6.0
5	195:06	1613-1617	650.162	3.1	1.8	1.8	114	261	265	57	48	79	79	6.0

Final ΔVm = 145.058 $\sqrt{\Delta p}$ = 1.7332 $\overline{\Delta H}$ = 1.73 $\overline{Ts}$ = 108 $\overline{Tm}$ = 76

$\overline{\Delta P}$ = 3.0051

Total Leak checks -.284

JBF

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/14/16 Sample Box No. SB-7
Sample Location Reshimy Baghouse
Train Preparer NP
Sample Recovery Person BF/RK
Comments CARB

Run No. P-CARB-2
Job No. 052074.0172
Filter No. NA UNTARED
Sample Head No. SH-3
Barometer No. TJC. com
Balance No. FB-2

Front Half
Acetone Liquid
Container No. P-CARB-2 Level Marked ✓ Sealed ✓

Filter
Container No. P-CARB-2 Sealed ✓

Description of Filter light grey loading

Samples Stored and Locked ✓

Back Half/Moisture
Container No. NA

Liquid Level Marked NA Sealed NA

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	–	–	510.0	537.5	27.5
2	H_2O	100	761.6	754.6	−7.0
3	–	–	667.6	669.5	1.9
4	Silica Gel	250	923.7	966.8	43.1
5					
6					
Total					65.5

Description of Impinger Catch: clear

BF

EQM

FIELD DATA SHEET

Plant: AK Middletown
Sampling Location: P. Baghouse #3
Run Number: P-carb-3 Date: 9/14/16
Pretest Leak Rate: .001 cfm @ 7 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: —

Sample Type: NF carb 428/429 Operator: GD/DA
Pbar: 30.21 Ps: -1.9
CO_2: _____ O_2: _____
Probe Length/Type: 3' G1 Pitot#: T3-1
Stack Diameter: 35.5" K: 0.6096

Nozzle ID: .156 Thermocouple #: T3-1
Assumed Bws: 1.8 Filter #: Untared
Meter Box #: 13 Y: 0.989 ΔH@: 1.783
Post-Test Leak Rate: .001 cfm @ 7 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

FILTER 2.999

.181 Leak check Loss

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	1635	650.382											
1	3:16	1638	652.812	3.1	1.8	1.8	113	249	261	60	50	79	79	6.0
2	6:37	1648-1652	655.151	3.2	1.8	1.8	114	250	261	58	48	80	79	6.5
3	9:57	1705-1708	657.598	3.1	1.8	1.8	115	251	260	57	49	80	79	7.0
4	13:19	1722-1725	660.129	3.1	1.8	1.8	118	247	259	58	49	79	79	7.0
5	16:39	1735-1738	662.818	3.1	1.8	1.8	116	253	261	59	50	80	79	7.0
6	20:15	2221-2224	665.774	3.2	1.9	1.9	92	263	259	67	57	71	71	8.0
1	23:45	2231-2234	668.393	3.0	1.8	1.8	94	260	259	59	57	70	71	7.0
2	27:00	2244-2248	670.878	3.1	1.8	1.8	96	259	259	58	58	70	71	7.0
3	30:15	2303-2307	673.292	3.0	1.7	1.7	97	258	260	60	58	70	71	7.0
4	33:45	2322-2326	675.822	3.0	1.7	1.7	102	259	258	60	57	70	71	7.0
5	37:00	2342-2346	678.278	2.9	1.7	1.7	97	255	259	63	59	70	70	7.0
6	40:15	0000-0004	680.672	2.9	1.7	1.7	100	257	259	63	58	70	70	7.0
1	43:30	0019-0023	683.153	2.9	1.7	1.7	98	258	259	63	59	70	70	7.0
2	46:45	0039-0042	685.560	2.9	1.7	1.7	99	258	259	64	60	70	70	7.0
3	50:00	0057-0100	688.003	2.9	1.7	1.7	99	260	260	64	60	70	70	7.0
4	53:30	0116-0120	690.555	2.9	1.7	1.7	100	254	259	65	60	70	70	7.0
5	56:45	0135-0138	693.006	2.9	1.7	1.7	95	257	257	65	60	70	70	7.0
6	60:00	0145-0148	695.405	2.9	1.7	1.7	95	261	259	65	61	70	69	7.0
1	63:15	0318-0322	697.868	2.9	1.7	1.7	97	259	259	65	61	70	70	7.0
2	66:30	0335-0338	700.300	3.0	1.8	1.8	84	258	260	65	62	70	69	7.0
3	69:45	0343-0347	702.699	3.0	1.8	1.8	85	258	259	62	53	69	69	7.0
4	73:00	0353-0356	705.178	3.0	1.8	1.8	85	259	257	61	52	70	69	7.0
5	76:15	0401-0404	707.662	3.0	1.8	1.8	86	256	260	60	53	70	69	7.0
6	79:30	0409-0413	710.095	3.0	1.8	1.8	86	257	257	60	54	71	69	7.0

1st page ΔVm = 59.532 $\overline{\sqrt{\Delta p}}$ = _____ $\overline{\Delta H}$ = _____ $\overline{Ts}$ = _____ $\overline{Tm}$ = _____

EQM

FIELD DATA SHEET

Plant: Ak Middletown | Sample Type: CARB428/429 | Operator: DA/GD | Nozzle ID: 0.156 | Thermocouple #: T3-1

Sampling Location: Rushing BH #3 | Pbar: 30.21 | Ps: -1.9 | Assumed Bws: 1.8 | Filter #: Untared

Run Number: P-CARB-3 | Date: 9/15/16 | CO_2: | O_2: | Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783

Night Shift Leak Check

Pretest Leak Rate: 0.002 cfm @ 9 in.Hg. | Probe Length/Type: 3'61 | Pitot#: T3-1 | Post-Test Leak Rate: ____ cfm @ ____ in.Hg.

Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: 0.6096 | Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
			710.095											
1	82:45	0419 0422	712.612	3.0	1.8	1.8	84	260	261	59	52	71	70	7.0
2	86:00	0433 0436	714.873	3.0	1.8	1.8	87	259	258	59	53	71	70	7.0
3	89:15	0447 0454	717.352	3.0	1.8	1.8	86	262	258	61	54	71	70	7.0
4	92:30	0508 0511	719.722	2.9	1.7	1.7	87	255	260	60	54	70	70	7.0
5	95:45	0525 0528	722.178	3.1	1.8	1.8	85	258	260	61	56	70	70	7.0
6	99:00	0535 0538	724.555	3.0	1.8	1.8	86	243	261	61	55	70	69	7.0
1	102:16	1034- 1037	727.268	2.9	1.7	1.7	94	245	260	63	54	65	65	7.0
2	105:32	1046- 1049	729.557	2.9	1.7	1.7	100	248	260	61	52	66	65	7.0
3	108:53	1057- 1100	731.959	2.9	1.6	1.6	110	250	263	58	49	66	66	7.0
4	112:11	1128- 1131	734.339	3.0	1.7	1.7	108	264	259	57	50	67	67	7.0
5	115:35	1138- 1141	736.775	2.8	1.6	1.6	113	259	259	56	50	68	67	7.0
6	118:56	1233- 1236	739.180	2.9	1.6	1.6	111	263	262	58	51	69	68	7.0
1	122:15	1241- 1244	741.425	2.9	1.6	1.6	112	261	260	59	50	71	70	7.0
2	125:29	1249- 1252	743.792	3.2	1.8	1.8	114	258	261	60	49	72	71	7.0
3	128:43	1258- 1301	746.108	3.0	1.7	1.7	118	265	258	57	50	73	71	7.0
4	132:01	1307- 1310	748.466	3.1	1.8	1.8	112	260	260	58	48	73	72	7.0
5	135:17	1318- 1321	750.839	3.1	1.8	1.8	113	264	259	57	48	73	72	7.0
6	138:41	1332- 1335	753.328	3.0	1.7	1.7	118	263	259	58	48	74	73	7.0
1	142:03	1341- 1344	755.818	3.0	1.7	1.7	115	256	260	57	47	74	73	7.0
2	145:16	1436- 1439	758.150	2.9	1.6	1.6	117	254	261	56	47	75	74	7.0
3	148:33	1448- 1451	760.643	3.0	1.7	1.7	114	259	258	58	48	76	75	7.0
4	151:57	1504- 1507	763.203	3.0	1.7	1.7	119	257	258	59	50	76	76	7.0
5	155:15	1521- 1524	765.656	3.2	1.8	1.8	118	259	257	58	49	76	76	7.0
6	158:33	1539- 1543	768.145	3.1	1.8	1.8	115	263	261	56	47	77	76	7.0

New volume 724.644 − 24.733 = 0.089

Leak check volume

Leak check Loss .178 + .181 = .359 TOTAL

Total Leak Check Loss .359

$\Delta Vm = 57.872 \sqrt{\Delta p} =$ ____ $\overline{\Delta H} =$ ____ $\overline{Ts} =$ ____ $\overline{Tm} =$ ____

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: Carb/428/429 | Operator: GD/DA
Sampling Location: P. Baghouse #3 | Pbar: 30.24 | Ps: -1.9
Run Number: P-Carb-3 | Date: 9/15/16 | CO_2: | O_2:
Pretest Leak Rate: .001 cfm @ 8 in.Hg. | Probe Length/Type: 3' G1 | Pitot#: T3-1
Pretest Leak Check: Pitot: ✓ | Orsat: — | Stack Diameter: 35.5" | K: 0.6096

Nozzle ID: .156 | Thermocouple #: T3-1
Assumed Bws: 1.8 | Filter #: Untared
Meter Box #: 13 | Y: 0.989 | ΔH@: 1.783
Post-Test Leak Rate: 0.002 cfm @ 10 in.Hg.
Post-Test Leak Check: Pitot: ✓ | Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
6	158:33	1539-1543	768.145											
1	161:52	1556-1559	770.762	3.1	1.8	1.8	115	254	258	59	50	77	77	7.0
2	165:10	1613-1619	773.378	3.2	1.8	1.8	113	255	260	57	50	77	77	7.5
3	168:29	1631-1634	775.930	3.2	1.8	1.8	112	259	261	57	49	77	77	7.5
4	171:50	1648-1651	778.516	3.1	1.8	1.8	110	259	260	58	49	78	77	7.5
5	175:07	1705-1709	781.078	3.0	1.7	1.7	117	251	260	56	48	77	77	7.5
6	178:25	1722-1725	783.630	3.1	1.8	1.8	119	258	260	57	49	78	78	7.5
1	181:41	1735-1738	786.079	3.1	1.8	1.8	113	262	260	58	50	78	78	7.5
2	185:00	2232-2235	788.794	3.1	1.8	1.8	91	262	259	68	52	70	70	7.5
3	188:15	2249-2252	791.266	3.0	1.8	1.8	89	251	259	64	50	70	70	7.5
4	191:30	2305-2309	793.692	2.9	1.7	1.7	90	256	260	63	50	70	70	7.5
5	194:45	2321-2325	796.103	2.9	1.7	1.7	92	248	258	61	51	70	70	7.5
6	198:00	2336-2340	798.551	2.9	1.7	1.7	99	247	259	61	53	70	70	7.5

0.451
.359
-.092
Leak checks
New volume 786.171

ΔVm = 147.718 $\sqrt{\Delta p}$ = 1.7342 $\overline{\Delta H}$ = 1.745 $\overline{Ts}$ = 103 $\overline{Tm}$ = 72

Δp = 3.01

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/15/14 Sample Box No. NSB-6
Sample Location Rocking Baghouse
Train Preparer MB/BF
Sample Recovery Person DA/CS
Comments CARB

Run No. P-CARB-3
Job No. 5607A.0172
Filter No. Quartz
Sample Head No. B
Barometer No. 1
Balance No. 1

Front Half
Acetone P-CARB-3 Liquid
Container No. _____ Level Marked ~~—~~ Sealed ✓

Filter
Container No. Quart P-CARB-3 Sealed ✓

Description of Filter Clear

Samples Stored and Locked ✓

TRAIN 6

Back Half/Moisture
Container No. P-CARB-3

Liquid Level Marked ~~—~~ Sealed ~~—~~

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	MT	-0-	490.3	511.4	21.1
2	H_2O	100	771.1	764.8	6.3
3	MT	-0-	694.0	697.7	3.7
4	Silica Gel	250	973.2	1012.8	39.6
5					
6					
Total					70.7

Description of Impinger Catch: Clear

EQM

D/F **FIELD DATA SHEET**

Plant: AK Middletown | Sample Type: CARB | Operator: NP

Sampling Location: Combustion Stack | Pbar: 30.20 | Ps: -.04

Run Number: CARB-1 | Date: 9-17-16 | CO_2: 3 | O_2: 15

Pretest Leak Rate: .001 cfm @ 10 in.Hg. | Probe Length/Type: 6'GL | Pitot#: T6-15P

Pretest Leak Check: Pitot: ✓± Orsat: — | Stack Diameter: 168" | K: 53.113

Nozzle ID: .500 | Thermocouple #: T6-15P

Assumed Bws: 10 | Filter #: unfired QZ

Meter Box #: 2 | Y: 1.005 | ΔH@: 1.687

Post-Test Leak Rate: .001 cfm @ 10 in.Hg.

Post-Test Leak Check: Pitot: ✓± Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	1005	284.387											
1	5	1010	287.2	.03	1.0	1.0	353	260	260	65	NA	65	65	3
2	10	1015	290.5	.04	1.4	1.4	355	261	264	65	66	63	63	3
3	15	1020	293.8	.04	1.4	1.4	358	265	263	64	65	63	63	3
4	20	1025	297.2	.04	1.4	1.4	359	264	263	59	65	64	64	3
5	25	1030	300.5	.04	1.4	1.4	363	257	264	56	63	65	64	5
6	30	1035	303.9	.04	1.4	1.4	366	264	264	54	63	67	64	5
7	35	1040	307.3	.04	1.4	1.4	369	269	265	55	64	69	65	5
8	40	1045	310.7	.04	1.4	1.4	373	267	264	56	48	72	66	5
9	45	1050	314.1	.04	1.4	1.4	367	266	264	57	50	75	67	5
10	50	1055	317.4	.04	1.4	1.4	344	268	265	57	50	76	68	5
11	55	1100	320.7	.04	1.4	1.4	345	264	264	59	57	77	69	5
12	60	1105	324.1	.04	1.4	1.4	351	262	264	58	49	79	70	5
1	65	1110	327.4	.04	1.4	1.4	353	266	264	57	48	80	70	5
2	70	1115	330.7	.04	1.4	1.4	354	267	250	57	47	80	71	5
3	75	1120	334.1	.04	1.4	1.4	359	266	264	56	56	81	73	5
4	80	1125	337.4	.04	1.4	1.4	361	263	264	56	52	81	73	5
5	85	1130	340.7	.04	1.4	1.4	364	265	264	56	53	82	74	5
6	90	1135	344.1	.04	1.4	1.4	370	257	264	56	55	83	74	5
7	95	1140	347.4	.04	1.4	1.4	372	265	264	56	54	83	75	5
8	100	1145	350.8	.04	1.4	1.4	376	266	264	57	53	84	75	5
9	105	1150	354.1	.04	1.4	1.4	372	257	264	57	55	84	76	5
10	110	1155	357.6	.04	1.4	1.4	375	258	263	57	55	84	76	5
11	115	1200	360.9	.04	1.4	1.4	346	270	264	60	56	85	77	5
12	120	1205	364.2	.04	1.4	1.4	357	262	263	60	56 ✓	86	77	5

$\Delta Vm =$ _____ $\overline{\sqrt{\Delta p}} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

EQM

FIELD DATA SHEET

Plant: AK Middletown
Sample Type: O/F CARB Operator: NP
Sampling Location: Combustion Stack
Pbar: 30.20 Ps: -.94
Run Number: C-CARB-1 Date: 9-12-16
CO_2: 3 O_2: 15
Pretest Leak Rate: .001 cfm @ 10 in.Hg.
Probe Length/Type: 6' GL Pitot#: T6-15P
Pretest Leak Check: Pitot: ✓ Orsat: —
Stack Diameter: 168" K: 53.113

Nozzle ID: .500 Thermocouple #: T6-15P
Assumed Bws: 10 Filter #: untared QZ
Meter Box #: 2 Y: 1.005 ΔH@: 1.687
Post-Test Leak Rate: .001 cfm @ 10 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
1	125	1210	367.6	.04	1.4	1.4	355	253	264	57	59	86	79	5
2	130	1215	371.0	.04	1.4	1.4	355	254	264	58	57	87	79	5
3	135	1220	374.4	.04	1.4	1.4	357	260	265	58	57	87	79	5
4	140	1225	378.3	.04	1.4	1.4	362	256	264	57	55	88	80	5
5	145	1230	381.6	.04	1.4	1.4	366	263	264	57	55	88	80	5
6	150	1235	385.0	.04	1.4	1.4	370	264	264	57	56	90	80	5
7	155	1240	389.4	.04	1.4	1.4	375	267	264	61	53	89	81	5
8	~~200~~ 160	1245	391.8	.04	1.4	1.4	376	267	265	61	60	89	81	5
9	~~205~~ 165	1250	395.1	.04	1.4	1.4	352	260	264	61	51	90	82	5
10	~~210~~ 170	1255	398.5	.04	1.4	1.4	344	261	263	58	53	90	82	5
11	~~215~~ 175	1300	401.9	.04	1.4	1.4	346	251	264	58	53	90	83	5
12	~~220~~ 180	1305	405.3	.04	1.4	1.4	349	261	264	58	55	90	83	5
1	~~225~~ 185	1310	408.8	.04	1.4	1.4	350	263	265	58	55	91	83	5
2	~~230~~ 190	1315	412.0	.04	1.4	1.4	353	263	265	58	53	90	83	5
3	~~235~~ 195	1320	415.0	.04	1.4	1.4	355	264	264	61	53	91	84	5
4	~~240~~ 200	1325	418.8	.04	1.4	1.4	356	265	263	61	53	91	84	5
5	~~245~~ 205	1330	422.1	.04	1.4	1.4	366	263	263	56	48	91	84	5
6	~~250~~ 210	1335	425.3	.04	1.4	1.4	377	267	265	56	49	92	85	5
7	~~255~~ 215	1340	428.9	.04	1.4	1.4	377	259	266	56	49	92	85	5
8	~~300~~ 220	1345	432.3	.04	1.4	1.4	378	253	265	56	48	92	85	5
9	~~305~~ 225	1350	434.8	.04	1.4	1.4	345	253	264	56	50	92	85	5
10	~~310~~ 230	1355	1139.2	.04	1.4	1.4	344	260	263	57	50	93	86	5
11	~~315~~ 235	1400	442.7	.04	1.4	1.4	352	261	263	57	51	93	86	5
12	~~320~~ 240	1405	445.855	.04	1.4	1.4	353	262	265	57	51	93	86	5

ΔVm = 161.468 $\sqrt{\Delta p}$ = ~~1.4444~~ ΔH = 1.3917 $\overline{Ts}$ = 360 $\overline{Tm}$ = 80

$\sqrt{\Delta p}$ = 0.19944 Ave Δp = .03979

BF

SAMPLE RECOVERY DATA

Plant AK Middletown 2 Run No. C-CARB - 1
Date 9/12/16 Sample Box No. 2 Job No. 0500741.0172
Sample Location COMBUSTION STACK Filter No. NA
Train Preparer NF Sample Head No. 10
Sample Recovery Person BF/RC Barometer No. PWL.com
Comments CARB Method Balance No. FB-2

Front Half
Acetone Liquid
Container No. C-CARB-1 Level Marked ✓ Sealed ✓

Filter
Container No. C-CARB-1 Sealed ✓

Description of Filter Black

Samples Stored and Locked ✓

Back Half/Moisture
Container No. NA

Liquid Level Marked NA Sealed NA

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	—	—	484.0	816.5	332.5
2	H_2O	100	768.3	729.4	-38.9
3	—	—	665.7	669.6	3.9
4	Silica	250	907.3	942.3	35.0
5					
6					
Total					332.5

Description of Impinger Catch: clear

VBF

EQM

FIELD DATA SHEET

Plant: AK Middletown
Sampling Location: Combustion Stack
Run Number: C-CARB-2 Date: 9-12-16
Pretest Leak Rate: .001 cfm @ 10 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: —

Sample Type: CARB Operator: AP
Pbar: 30.15 Ps: -.9
CO_2: 3 O_2: 15
Probe Length/Type: 6' GL Pitot#: T6-15P
Stack Diameter: 168" K: 53.13

Nozzle ID: .500 Thermocouple #: T6-15P
Assumed Bws: 10 Filter #: untared QZ
Meter Box #: 2 Y: 1.005 ΔH@: 1.687
Post-Test Leak Rate: — cfm @ — in.Hg.
Post-Test Leak Check: Pitot: — Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	955	446.130											
1	5	1000	449.4	.04	1.3	1.3	379	260	260	65	60	63	63	4
2	10	1005	452.7	.04	1.3	1.3	353	252	270	65	60	63	64	4
3	15	1010	456.9	.04	1.4	1.4	356	262	265	63	36	67	66	4
4	20	1015	459.3	.04	1.4	1.4	355	264	265	61	37	68	66	4
5	25	1020	462.5	.04	1.4	1.4	357	264	265	58	37	70	67	4
6	30	1025	465.8	.04	1.4	1.4	362	266	262	59	37	73	67	4
7	35	1030	469.3	.04	1.4	1.4	364	265	264	59	37	74	67	5
8	40	1035	472.5	.04	1.4	1.4	371	264	264	60	37	76	69	5
9	45	1040	475.8	.04	1.4	1.4	374	264	265	60	38	77	69	5
10	50	1045	479.1	.04	1.4	1.4	374	264	264	60	38	78	69	5
11	55	1050	482.4	.04	1.4	1.4	380	264	265	60	37	78	70	5
12	60	1055	485.7	.04	1.4	1.4	345	263	264	59	38	80	71	5
1	65	1100	489.1	.04	1.4	1.4	346	264	263	59	38	81	72	5
2	70	1105	492.4	.04	1.4	1.4	349	265	265	60	38	82	73	5
3	75	1110	495.8	.04	1.4	1.4	351	263	264	60	39	82	73	5
4	80	1115	499.2	.04	1.4	1.4	350	264	264	60	39	83	73	5
5	85	1120	502.6	.04	1.4	1.4	351	264	264	62	40	85	76	5
6	90	1125	505.9	.04	1.4	1.4	361	266	265	61	41	86	77	5
7	95	1130	509.2	.04	1.4	1.4	367	264	264	62	42	87	78	5
8	100	1135	513.1	.04	1.4	1.4	368	263	263	62	42	88	78	5
9	105	1140	516.0	.04	1.4	1.4	372	264	264	62	43	88	78	5
10	110	1145	519.5	.04	1.4	1.4	375	267	263	63	44	88	79	5
11	115	1150	522.8	.04	1.4	1.4	380	265	263	64	44	88	80	5
12	120	1155	526.4	.04	1.4	1.4	380	264	263	64	44	84	81	5

$\Delta Vm =$ _____ $\overline{\sqrt{\Delta p}} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

EQM

FIELD DATA SHEET

Plant: AK Middletown Sample Type: CARB Operator: NP

Sampling Location: Combustion Stack Pbar: 30.15 Ps: -.9

Run Number: C-CARB-2 Date: 9-8-16 CO_2: 3 O_2: 15

Pretest Leak Rate: .01 cfm @ 10 in.Hg. Probe Length/Type: 6' GL Pitot#: T6-15P

Pretest Leak Check: Pitot: √± Orsat: — Stack Diameter: 168" K: 53.113

Nozzle ID: .500 Thermocouple #: T6-15P

Assumed Bws: 10 Filter #: Untared Qz

Meter Box #: 2 Y: 1.005 ΔH@: 1.681

Post-Test Leak Rate: .002 cfm @ 9 in.Hg.

Post-Test Leak Check: Pitot: √± Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature EF Probe	Temperature EF Filter	Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
1	125	1200	530.0	.04	1.4	1.4	355	264	263	55	36	89	82	5
2	130	1205	533.1	.04	1.4	1.4	355	265	265	56	37	89	82	5
3	135	1210	536.5	.04	1.4	1.4	355	264	263	56	37	90	82	5
4	140	1215	539.9	.04	1.4	1.4	356	264	263	56	38	90	82	5
5	145	1220	543.3	.04	1.4	1.4	357	266	264	58	37	90	82	5
6	150	1225	546.7	.04	1.4	1.4	358	269	264	58	38	90	82	5
7	155	1230	550.1	.04	1.4	1.4	360	264	264	58	39	91	83	5
8	160	1235	553.5	.04	1.4	1.4	361	265	263	58	39	90	83	5
9	165	1240	556.9	.04	1.4	1.4	373	264	264	53	37	90	83	5
10	170	1245	560.5	.04	1.4	1.4	375	264	263	53	37	90	83	5
11	175	1250	563.8	.04	1.4	1.4	358	264	263	54	37	90	83	5
12	180	1255	567.3	.04	1.4	1.4	359	264	262	54	37	90	83	5
1	185	1300	570.6	.04	1.4	1.4	348	268	265	57	38	90	83	5
2	190	1305	574.0	.04	1.4	1.4	349	258	265	56	37	89	83	5
3	195	1310	577.4	.04	1.4	1.4	352	265	264	55	38	89	83	5
4	200	1315	580.8	.04	1.4	1.4	353	263	264	56	38	89	83	5
5	205	1320	584.2	.04	1.4	1.4	355	262	264	56	38	89	83	5
6	210	1325	587.6	.04	1.4	1.4	357	265	265	57	40	90	83	5
7	215	1330	591.2	.04	1.4	1.4	368	264	264	62	43	90	83	5
8	220	1335	594.3	.04	1.4	1.4	369	261	264	61	43	90	83	5
9	225	1340	598.0	.04	1.4	1.4	372	266	264	60	41	90	83	5
10	230	1345	601.3	.04	1.4	1.4	375	262	264	60	40	90	83	5
11	235	1350	604.6	.04	1.4	1.4	373	263	264	59	40	91	84	5
12	240	1355	608.096	.04	1.4	1.4	370	264	264	58	40	91	84	5

ΔVm = 161.9662 $\sqrt{\Delta p}$ = .2000 $\overline{\Delta H}$ = 1.3950 $\overline{Ts}$ = 362 $\overline{Tm}$ = 91

Ave DP= .04

JBF

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Middletown
Date 9/10/16 Sample Box No. HSB-2
Sample Location COMBUSTION
Train Preparer BF/RK
Sample Recovery Person BF/RK
Comments CARB

Run No. Combo CARB - 2
Job No. 052074.0172
Filter No. NA
Sample Head No. JH-10
Barometer No. TVC.com
Balance No. FB-2

Front Half
Acetone Liquid
Container No. C-CARB-2 Level Marked ✓ Sealed ✓

Filter
Container No. C-CARB-2 Sealed ✓

Description of Filter black

Samples Stored and Locked ✓

Back Half/Moisture
Container No. NA

Liquid Level Marked NA Sealed NA

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	—	—	486.0	815.3	329.3
2	H_2O	100	773.5	765.7	-7.8
3	—	—	669.3	674.1	4.8
4	Silica Gel	250	982.2	1016.9	34.7
5					
6					
Total					361.0

Description of Impinger Catch: clear

JBF

EQM

FIELD DATA SHEET

Plant: AK Middletown Sample Type: CARB Operator: NP

Sampling Location: Combustion Stack Pbar: 30.21 Ps: -.9

Run Number: C-CARB3 Date: 9-14-16 CO_2: 3 O_2: 15

Pretest Leak Rate: .001 cfm @ 10 in.Hg. Probe Length/Type: 6' GL Pitot#: TG-15P

Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 164" K: 53.113

Nozzle ID: .500 Thermocouple #: TG-15P

Assumed Bws: 10 Filter #: Unfared QZ

Meter Box #: 2 Y: 1.005 ΔH@: 1.667

Post-Test Leak Rate: ____ cfm @ ____ in.Hg.

Post-Test Leak Check: Pitot: ____ Orsat: ____

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0	955	608.340											
1	5	1000	611.6	.04	1.4	1.4	350	260	260	65	38	62	62	4
2	10	1005	614.9	.04	1.4	1.4	345	265	267	65	38	64	64	4
3	15	1010	618.2	.04	1.4	1.4	350	263	264	65	42	65	64	4
4	20	1015	621.5	.04	1.4	1.4	352	265	264	56	34	66	65	5
5	25	1020	624.8	.04	1.4	1.4	351	266	264	49	34	68	65	5
6	30	1025	628.2	.04	1.4	1.4	352	266	265	49	34	68	65	5
7	35	1030	631.6	.04	1.4	1.4	357	263	264	48	35	70	66	5
8	40	1035	634.9	.04	1.4	1.4	362	265	264	49	35	71	67	5
9	45	1040	638.4	.04	1.4	1.4	364	262	264	49	34	74	67	5
10	50	1045	641.7	.04	1.4	1.4	367	264	263	51	33	75	68	5
11	55	1050	645.1	.04	1.4	1.4	373	265	264	53	33	77	69	5
12	60	1055	648.4	.04	1.4	1.4	343	264	264	53	33	80	71	5
1	65	1100	651.8	.04	1.4	1.4	345	264	264	53	34	80	71	5
2	70	1105	655.1	.04	1.4	1.4	351	261	265	57	35	84	74	5
3	75	1110	658.4	.04	1.4	1.4	352	268	265	56	35	86	74	5
4	80	1115	661.8	.04	1.4	1.4	350	265	264	56	35	84	75	5
5	85	1120	665.1	.04	1.4	1.4	348	267	263	57	35	84	75	5
6	90	1125	668.8	.04	1.4	1.4	358	263	265	56	36	84	76	5
7	95	1130	671.9	.04	1.4	1.4	367	261	264	58	37	86	77	5
8	100	1135	675.2	.04	1.4	1.4	368	266	264	58	37	86	77	5
9	105	1140	678.5	.04	1.4	1.4	370	265	263	58	37	86	78	5
10	110	1145	681.9	.04	1.4	1.4	371	264	264	59	37	86	78	5
11	115	1150	685.4	.04	1.4	1.4	370	265	261	59	38	87	78	5
12	120	1155	688.7	.04	1.4	1.4	364	266	263	59	38	87	78	5

$\Delta Vm =$ _____ $\sqrt{\Delta p} =$ _____ $\overline{\Delta H} =$ _____ $\overline{Ts} =$ _____ $\overline{Tm} =$ _____

EQM

FIELD DATA SHEET

Plant: AK Middletown
Sampling Location: Combustion Stack
Run Number: C-CARB-3
Pretest Leak Rate: .001 cfm @ 10 in.Hg.
Pretest Leak Check: Pitot: √ Orsat: —

Sample Type: CARB
Pbar: 30.21 Ps: -.9
CO_2: 3 O_2: 15
Probe Length/Type: 6' GL Pitot#: T6-15P
Stack Diameter: 168" K: 53.113

Operator: MP

Nozzle ID: -500 Thermocouple #: T6-15P
Assumed Bws: 10 Filter #: Untared QZ
Meter Box #: 2 Y: 1.005 ΔH@: 1.687
Post-Test Leak Rate: .001 cfm @ 8 in.Hg.
Post-Test Leak Check: Pitot: √ Orsat: NA

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature BF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
1	125	1200	692.1	.04	1.4	1.4	352	264	263	65	48	88	81	5
2	130	1205	695.6	.04	1.4	1.4	352	264	263	65	41	89	81	5
3	135	1210	699.1	.04	1.4	1.4	353	264	264	61	39	89	81	5
4	140	1215	702.5	.04	1.4	1.4	355	265	265	55	37	89	82	5
5	145	1220	706.0	.04	1.4	1.4	355	266	264	54	37	89	82	5
6	150	1225	709.4	.04	1.4	1.4	351	265	264	54	34	89	82	5
7	155	1230	712.7	.04	1.4	1.4	360	266	265	53	34	90	83	5
8	160	1235	716.3	.04	1.4	1.4	365	263	263	53	35	90	83	5
9	165	1240	719.8	.04	1.4	1.4	365	264	264	53	35	90	83	5
10	170	1245	723.2	.04	1.4	1.4	365	265	265	53	35	90	83	5
11	175	1250	726.6	.04	1.4	1.4	378	261	263	54	35	91	84	5
12	180	1255	730.0	.04	1.4	1.4	363	267	263	55	35	91	84	5
1	185	1300	733.4	.04	1.4	1.4	346	264	264	56	34	91	84	5
2	190	1305	737.1	.04	1.4	1.4	348	260	265	57	35	91	84	5
3	195	1310	740.8	.04	1.4	1.4	349	267	264	57	35	91	84	5
4	200	1315	744.2	.04	1.4	1.4	354	266	264	56	36	91	85	5
5	205	1320	747.2	.04	1.4	1.4	356	266	263	58	36	91	85	5
6	210	1325	750.7	.04	1.4	1.4	356	265	265	59	37	92	85	5
7	215	1330	753.8	.04	1.4	1.4	353	260	264	58	36	92	85	5
8	220	1335	757.2	.04	1.4	1.4	356	263	263	58	36	92	85	5
9	225	1340	760.6	.04	1.4	1.4	359	262	264	57	35	92	86	5
10	230	1345	764.0	.04	1.4	1.4	360	261	263	57	35	93	86	5
11	235	1350	767.5	.04	1.4	1.4	361	260	265	57	35	93	86	5
12	240	1355	770.961	.04	1.4	1.4	362	265	263	58	35	93	86	5

ΔVm = 162.621 $\overline{\sqrt{\Delta p}}$ = .2 $\overline{\Delta H}$ = 1.4 $\overline{Ts}$ = 357 $\overline{Tm}$ = 81

Ave DP = .04

√

COMBUSTION

EQM Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant AK Steel - Middletown
Date 9/14/16 Sample Box No. HSB-2
Sample Location Combustion
Train Preparer BF/RK
Sample Recovery Person BF/RK
Comments Carb Train

Run No. C-CARB-3
Job No. 5074.0172
Filter No. Run 2
Sample Head No. SH 10
Barometer No. TWC Com
Balance No. 1-B-2

Front Half
Acetone Liquid
Container No. C-CARB-3 Level Marked ✓ Sealed ✓

Filter
Container No. C-CARB-3 Sealed ✓

Description of Filter black

Samples Stored and Locked ✓

Back Half/Moisture
Container No. NA

Liquid Level Marked NA Sealed NA

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	-0-	-0-	487.2	867.8	380.6
2	H2O	100	771.9	767.1	-4.8
3	-0-	-0-	670.9	676.0	5.1
4	Silicagel	250	965.8	1001.8	36.0
5					
6					
Total					416.9

Description of Impinger Catch: Clear

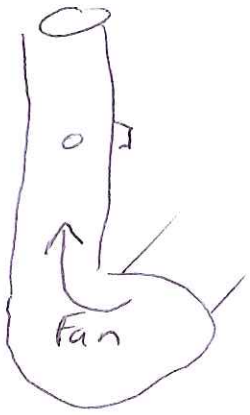
✓BF

FLOW

EQM Environmental Quality Management, Inc.

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

Plant: Ak steel - Middletown
Date: 8/22/16
Sampling Location: Pushing Baghouse Stacks 1-5
Inside of Far Wall to Outside of Nipple: 41 1/2
Inside of Near Wall to Outside of Nipple (Nipple Length): 6
Stack I.D.: 35 1/2
Distance Downstream from Flow Disturbance (Distance B):
300 Inches/Stack I.D. = 8.5 dd
Distance Upstream from Flow Disturbance (Distance A):
72 Inches/Stack I.D. = 20 dd
Calculated By: Doug Allen



Schematic of Sampling Location

Traverse Point Number	Fraction of Length	Length (inches)	Product of Columns 2 & 3 (To nearest 1/8")	Nipple Length (inches)	Traverse Point Location (Sum of Col. 4 & 5)
1	0.044	35.5	1.56	6"	7.6
2	0.146	↓	5.2	↓	11.2
3	0.296	↓	10.5	↓	16.5
4	0.704	↓	25.0	↓	31.0
5	0.854	↓	30.3	↓	36.3
6	0.956	↓	33.9	↓	39.9

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK Steel Middletown
Location: Pushing Baghouse
Project No.: 5007401772

Operator: Doug Allen / Ben Fern
Date: 8/30/16

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time:		Time: 11:22			Time: 12:26			Time: 13:20			
O2	Zero	0	0.134	0.277	0.22			0.27				0.24		
	Low	–												
	Mid	11.02	11.060	11.016	11.08			10.95				11.01		
	High	21.89	21.991	21.841	21.77			21.77				21.66		
CO2	Zero	0	0.106	0.206	0.18			0.11				0.08		
	Low	–												
	Mid	11.23	11.070	11.081	~~11.16~~ ~~11.08~~ OF			10.97				11.20		
	High	21.94	21.987	21.798	21.97			21.88				21.86		
CO	Zero	0	1.00	-0.28	-1.8			-2.0				-2.0		
	Low	–												
	Mid	190.9	188.47	190.25	186.9			184.5				183.9		
	High	454.8	459.85	452.75										
	Zero													
	Low													
	Mid													
	High													
Averages														

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK Middletown
Location: Pushing Baghouse
Project No.: 0500749.0112

Operator: Ben Fern
Date: 8/30/16

Final cal

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time:		Time: 1502			Time: 1602			Time: 1711			
O_2	Zero	0			0.26			0.21			0.25			0.23
	Low	—												
	Mid	11.02			11.02			10.99			10.95			11.04
	High	21.89			21.72			21.69			21.70			21.65
CO_2	Zero	0			0.27			0.21			0.16			0.16
	Low	—												
	Mid	11.23			10.99			10.97			11.01			10.99
	High	21.94			21.81			21.74			21.56			21.69
CO	Zero	0			-2.0			-1.8			-2.8			-3.0
	Low													
	Mid	190.9			183.9			182.9			181.3			181.3
	High	454.8												
	Zero													
	Low													
	Mid													
	High													
Averages														

EQM Environmental Quality Management, Inc.

Test Start @ 1020 End @ 1502

CEM CALIBRATION DATA SHEET

Company: AK Steel Middletown
Location: Baghouse
Project No.: 50074.0172

Operator: Allen
Date: 5/3/16

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time:		Time: 1350			Time: 1525			Time:			
O2	Zero	0	0.210	0.227	0.2			0.356						
	Low	–	–	–										
	Mid	11.02	11.021	11.03										
	High	21.89	21.875	21.683	21.6			21.726						
CO2	Zero	0	0.221	0.205	0.2			0.082						
	Low	–	–	–										
	Mid	11.23	11.016	10.973	10.7			10.893						
	High	21.94	21.896	21.85										
CO	Zero	0	1.65	1.09	-1.5			0.05						
	Low	–	–	–										
	Mid	190.9	192.39	188.98	184.6			189.36						
	High	454.8	461.51	454.47										
	Zero													
	Low													
	Mid													
	High													
Averages				O2	20.347									
				CO2	0.309									
				CO	19.53									

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK Steel Middletown
Location:
Project No.: 50074.0172

Operator: C Janzen
Date: 9/6/16

COMBUSTION — PUSHING

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response (SYSTEM)			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time:		Time: 1002 - 1434			Time: ~~1504~~ - 1525 - 1739			Time:			
O2	Zero	0	0.181	0.075	0.119	0.047		0.024	-0.018					
	Low	—												
	Mid	11.02	11.199	10.937										
	High	21.89	22.059	21.769	21.829	21.952		21.927	22.045					
CO2	Zero	0	0.252	0.158	0.258	0.134		0.079	0.052					
	Low	—												
	Mid	11.33	11.224	11.083	10.946	11.242		11.163	11.264					
	High	21.94	22.175	21.720										
CO	Zero	0	0.71	0.91	-0.72	0.09		-0.43	-0.51					
	Low	—												
	Mid	190.9	189.75	189.87	184.22	185.75		184.57	184.81					
	High	454.8	453.68	449.74										
	Zero													
	Low													
	Mid													
	High													
Averages				O2		15.041			20.783					
				CO2		3.059			0.306					
				CO		59.71			23.36					

PAUSED 1300 CONDITIONER OFF
RESTART 1307 CAL

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK Steel Middletown
Location: Combustion / Pushing
Project No.: 52074-0172

Operator: Doug Allen
Date: 9/7/16

Combustion | Pushing | Combustion

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		~~Post Test Run 1~~ Response			~~Post Test Run 2~~ Response			~~Post Test Run 3~~ Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time: 800		Time: 0835-1035			Time: 1051-1743			Time:			
O_2	Zero	0	0.067	0.088	-0.063			0.091						
	Low	–												
	Mid	11.02	11.198	10.907										
	High	21.89	22.303	21.972	21.680			22.070						
CO_2	Zero	0	0.150	0.164	0.045			0.083						
	Low	–												
	Mid	11.33	11.242	11.021	10.714			10.111						
	High	21.94	22.284	21.801										
CO	Zero	0	2.1	2.98	3.68			1.36						
	Low	–	–											
	Mid	190.9	192.01	188.64	186.11			186.51						
	High	454.8	455.06	450.25										
	Zero													
	Low													
	Mid													
	High													
Averages				O_2	14.191			20.765						
				CO_2	3.597			0.295						
				CO	68.07			27.59						

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK steel Middletown
Location: Combustion Stack
Project No.: 50074.0272

Operator: Doug Allen
Date: 9/8/16

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time: 0820		Time: 0935-1345			Time: 1355-1655			Time:			
O2	Zero	0	-0.013	0.074	0.076			0.077						
	Low	/	—	—										
	Mid	11.02	11.036	10.935										
	High	21.89	21.964	21.981	21.918			21.873						
CO2	Zero	0	0.057	0.164	0.199			0.182						
	Low	—	—	—										
	Mid	11.33	11.025	11.117	10.979			11.014						
	High	21.94	22.011	21.869										
CO	Zero	0	1.7	3.3	2.54			1.67						
	Low	—	—	—										
	Mid	190.9	191.77	191.97	188.12			187.59						
	High	454.8	458.17	454.50										
	Zero													
	Low													
	Mid													
	High													
Averages				O2	13.586			13.902						
				CO2	3.913			3.731						
				CO	85.19			83.12						

EQM Environmental Quality Management, Inc.

Start 1020 End 1620

CEM CALIBRATION DATA SHEET

Company: AK Steel Middletown
Location: Pushing Baghouse
Project No.: 50074.0172

Operator: Doug Allen
Date: 9/1/16

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time: 0840		Time: 1350			Time:			Time:			
O2	Zero	0	0.119	0.259	0.3			0.382						
	Low	—	—	-										
	Mid	11.02	10.908	11.040										
	High	21.89	21.649	21.659	21.7			21.710						
COL	Zero	0	0.055	0.151	0.1			0.204						
	Low	—	—	—										
	Mid	11.33	11.098	10.982	11.0			10.954						
	High	21.94	22.046	21.761										
CO	Zero	0	0.41	0.92	0.9			0.22						
	Low	-	—	-										
	Mid	190.9	188.34	189.05	186.0			184.44						
	High	454.8	452.31	451.39										
	Zero													
	Low													
	Mid													
	High													
Averages				O2	20.672									
				CO2	0.316									
				CO	20.55									

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK Steel Middletown
Location: Combustion & Pushing BH
Project No.: 52974.0172 combustion system

Operator: Ben Fern / Ron Kolde
Date: 9/12/16
pushing system post test

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time:	900	Time:	1005 – 1305		Time:	1336 – 1741		Time:			
O2	Zero	0	-0.009	0.085	~~0.085~~	-0.098		-0.062	-0.046					
	Low	–		~~11.088~~										
	Mid	11.02	10.95	~~10.95~~	~~14.718~~			10.945						
	High	21.89	22.03	22.179		21.879		21.932	21.910					
CO2	Zero	0	0.064	0.146	4	0.018		0.054	0.072					
	Low	–												
	Mid	11.33	11.06	11.218	~~3.452~~	10.946		11.085	10.968					
	High	21.94	22.12	~~22.008~~ ~~22.12~~				22.063	~~21.910~~					
CO	Zero	0		5.26		7.20		6.26	7.92					
	Low	–												
	Mid	190.9	192.07	192.03	~~91.10~~	193.01		193.18	192.91					
	High	454.8	454.10	455.14				455.91						
	Zero													
	Low													
	Mid													
	High													
Averages	O2				14.718			20.728						
	CO2				3.452			0.254						
	CO				91.10			37.57						

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK STEEL MIDDLETOWN
Location: PUSHING BAGHOUSE
Project No.: 050074.0172

Operator: C Janzen
Date: 9/12/16 - 9/13/16

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time:		Time: 1057 - 0402			Time:			Time:			
O_2	Zero	0		-0.022	0.009									
	Low	—												
	Mid	11.02												
	High	21.89		22.111	22.003									
CO_2	Zero	0		-0.007	0.079									
	Low	—												
	Mid	11.33		11.139	10.967									
	High	21.94												
CO	Zero	0		-0.54	0.54									
	Low	—												
	Mid	190.9		193.21	190.54									
	High	454.8												
	Zero													
	Low													
	Mid													
	High													
Averages														
	O_2													
	CO_2													
	CO													

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK STEEL MIDDLETOWN
Location: COMBUSTION STACK / PUSHING BAGHOUSE
Project No.: 050074.0172
Operator: BF
Date: 9/13/16

COMBUSTION RUN — PUSHING SYSTEM CAL — PUSHING RUN

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time: 915		Time: 0955 – 1259			Time: 1310			Time: 1339 –			
O_2	Zero	0	-0.095	0.072	-0.129			0.232			-0.061			
	Low													
	Mid	11.02	11.003	10.953	10.94			10.968						
	High	21.89	22.067	21.925	21.936			21.976			22.011			
CO_2	Zero	0	-0.018	0.172	0.045			0.032			0.082			
	Low													
	Mid	11.33	11.132	10.994	11.074			11.017			11.066			
	High	21.94	22.099	22.915	22.119			22.062						
CO	Zero	0	-1.31	1.02	1.00			1.07			1.88			
	Low													
	Mid	~~190.9~~ 190	189.58	189.00	190.45			191.52			192.07			
	High	454.8	456.82	456.96				459.88						
	Zero													
	Low													
	Mid													
	High													
Averages	O_2				14.387						20.741			
	CO_2				3.59						0.241			
	CO				69.85						30.76			

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK MIDDLETOWN
Location: PUSHING BAGHOUSE
Project No.: 050074.0172

Operator: Chris Janzen
Date: 9/13 - 14/16

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time:		Time: 1000 - 0200			Time: 0208 - 0448			Time:			
O_2	Zero	0		-0.076	0.010			-0.066						
	Low	—												
	Mid	11.02												
	High	21.89		22.020	22.023			22.027						
CO_2	Zero	0		0.042	0.116			0.027						
	Low	—												
	Mid	11.33		11.002	10.969			10.981						
	High	21.94												
CO	Zero	0		2.29	1.67			1.11						
	Low	—												
	Mid	190		192.02	191.19			190.64						
	High	454.8												
	Zero													
	Low													
	Mid													
	High													
Averages	O_2													
	CO_2													
	CO													

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK Middletown
Location: Combustion Stack, Pushing Baghouse
Project No.: 050074.0172

Operator: Ben Fern
Date: 9/14/16

COMBUSTION | COMBUSTION RUN 3 | PUSHING SYSTEM CAL | PUSHING RUN

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time: 902		Time: 955 – 1255			Time: 1300			Time: 1313 – 1738			
O_2	Zero	0	-0.018	-0.101	-0.139			0.006			-0.077			
	Low	–												
	Mid	11.02		11.015				11.143						
	High	21.84	22.138	21.749	21.957			22.185			22.017			
CO_2	Zero	0	0.033	0.022	0.010			0.063			0.070			
	Low	–												
	Mid	11.33	11.170	10.844	11.003			11.199			11.081			
	High	21.94		22.193				22.260						
CO	Zero	0		3.12	2.02			1.61			3.07			
	Low	–												
	Mid	190.0	190.62	190.33	190.33						193.08			
	High	454.8	457.30					457.30						
	Zero													
	Low													
	Mid													
	High													
Averages	O_2				14.076						20.777			
	CO_2				3.638						0.278			
	CO				76.08						34.38			

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK Middletown
Location: Pushing Baghouse
Project No.: 050074.0172

Operator: C Janzen
Date: 9/14 - 15/16

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time:		Time:	-0218		Time:			Time:			
O_2	Zero	0		-0.079	0.049									
	Low													
	Mid	11.02												
	High	21.89		22.152	22.227									
CO_2	Zero	0		-0.035	0.134									
	Low													
	Mid	11.23		11.195	11.199									
	High	21.94												
CO	Zero	0		2.18	2.13									
	Low													
	Mid	190		188.37	189.79									
	High	454.8												
	Zero													
	Low													
	Mid													
	High													
Averages														

EQM Environmental Quality Management, Inc.

CEM CALIBRATION DATA SHEET

Company: AK Middletown
Location: Combustion Stack / Pushing Baghouse
Project No.: 0500741.0172

Operator: Benjamin Fern
Date: 9/15/16

Combustion Combustion Run — Pushing System Cal — Pushing Run

Pollutant/ Range/ Inst. ID	Cal Gas	Cal Gas Conc.	Calibration Response		Post Test Run 1 Response			Post Test Run 2 Response			Post Test Run 3 Response			Cylinder No.
			Direct	System	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	ppm/%	%Drift	%Bias	
			Time: 0900		Time: 0945 - 1245			Time: 1251			Time: 1307 - 1738			
O_2	Zero	0	0.026	-0.022	-0.139			-0.084			-0.092			
	Low	–												
	Mid	11.02	11.007	11.157				10.982						
	High	21.84		21.963	22.005			22.045			~~20.773~~	22.039		
CO_2	Zero	0	0.071	0.015	0.022			0.007			0.044			
	Low	–												
	Mid	11.23		10.990	11.093			11.071			~~0.300~~ ~~0.003~~	11.028		
	High	21.94	22.193	22.386				22.176						
CO	Zero	0		1.99				2.40			3.76			
	Low	–												
	Mid	190	191.07	189.26	190.79			192.46			192.69			
	High	454.8	456.27	454.82				456.75						
	Zero													
	Low													
	Mid													
	High													
Averages	O_2				12.464						20.730			
	CO_2				3.932						0.300			
	CO				73.50						33.69			

EQM

Flows

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: _____ | Operator: EZ | Nozzle ID: _____ | Thermocouple #: _____

Sampling Location: Baghouse Stack 1 | Pbar: 30.11 | Ps: -1.0 | Assumed Bws: — | Filter #: _____

Run Number: # Flow | Date: 8/29/16 | CO_2: _____ | O_2: _____ | Meter Box #: ~~1010~~ 11 | Y: 1.010 | ΔH@: 1.791

Pretest Leak Rate: ___ cfm @ __ in.Hg. | Probe Length/Type: _____ | Pitot#: _____ | Post-Test Leak Rate: ____ cfm @ ____ in.Hg.

Pretest Leak Check: Pitot: √ Orsat: _____ | Stack Diameter: 39.5" | K: — | Post-Test Leak Check: Pitot: _____ Orsat: _____

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0													
1				2.8			118							
2				2.9			122							
3				2.9			125							
4				2.9			124							
5				3.0			122							
6				3.0			127							
1				2.9			123							
2				3.2			123							
3				3.2			123							
4				3.2			125							
5				3.2			123							
6				3.1			120							
#1														
2														
3														
4														
5														
6														
1														
2														
3														
4														
5														
6														
1														

ΔVm = _____ $\overline{\sqrt{\Delta p}}$ = 1.7388 $\overline{\Delta H}$ = _____ $\overline{Ts}$ = 123 $\overline{Tm}$ = _____

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: Flows | Operator: EZ | Nozzle ID: _____ | Thermocouple #: _____

Sampling Location: Baghouse Stack 1 | Pbar: 30.20 | Ps: -1.1 | Assumed Bws: ___ | Filter #: _____

Run Number: Flows | Date: 9/12/16 | CO_2: _____ | O_2: _____ | Meter Box #: 11 | Y: 1.010 | ΔH@: 1.791

Pretest Leak Rate: ___ cfm @ ___ in.Hg. | Probe Length/Type: _____ | Pitot#: _____ | Post-Test Leak Rate: ____ cfm @ ____ in.Hg.

Pretest Leak Check: Pitot: √ Orsat: ____ | Stack Diameter: 39.5" | K: _____ | Post-Test Leak Check: Pitot: _____ Orsat: ___

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
0	0													
1				2.7			92							
2				2.7			102							
3				3.5			110							
4				3.7			115							
5				3.4			121							
6				3.5			118							
P1				3.2			129							
P2				3.0			125							
3				3.4			121							
4				3.5			115							
5				3.3			126							
6				3.4			130							
1				3.1			135							
2				3.2			130							
3				3.2			120							
4				3.1			132							
5				3.0			138							
6				3.0			127							
1				3.0			126							
2				2.9			120							
3				2.9			125							
4				3.0			135							
5				3.0			130							
6				3.0			127							

ΔVm = _____ $\overline{\sqrt{\Delta p}}$ = 1.774 $\overline{\Delta H}$ = _____ $\overline{Ts}$ = 123 $\overline{Tm}$ = _____

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: _____ | Operator: CJ

Sampling Location: Baghouse Stack 1 | Pbar: _____ | Ps: -1.1

Run Number: Flow | Date: 9/12-13/16 | CO_2: _____ | O_2: _____

Pretest Leak Rate: ___ cfm @ __ in.Hg. | Probe Length/Type: _____ | Pitot#: _____

Pretest Leak Check: Pitot: ____ Orsat: ____ | Stack Diameter: _____ | K: _____

Nozzle ID: _____ | Thermocouple #: _____

Assumed Bws: ___ | Filter #: _____

Meter Box #: _____ | Y: _____ | ΔH@: _____

Post-Test Leak Rate: ____ cfm @ ____ in.Hg.

Post-Test Leak Check: Pitot: _____ Orsat: ___

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
1	~~2222~~	2222		3.1			90							
2		2234		3.0			94							
3		2245		3.0			99							
4		2306		3.1			97							
5		2325		3.2			97							
6		2343		3.1			98							
		0004		3.1			92							

ΔVm = _____ $\overline{\sqrt{\Delta p}}$ = _____ $\overline{\Delta H}$ = _____ $\overline{Ts}$ = _____ $\overline{Tm}$ = _____

EQM

FIELD DATA SHEET

Plant: AK Middletown | Sample Type: _____ | Operator: _____ | Nozzle ID: _____ | Thermocouple #: _____

Sampling Location: Bayhouse Stack 1 | Pbar: _____ | Ps: _____ | Assumed Bws: ___ | Filter #: _____

Run Number: _____ | Date: 9/13/16 | CO_2: _____ | O_2: _____ | Meter Box #: _____ | Y: _____ | ΔH@: _____

Pretest Leak Rate: ___ cfm @ __ in.Hg. | Probe Length/Type: _____ | Pitot#: _____ | Post-Test Leak Rate: ____ cfm @ ____ in.Hg.

Pretest Leak Check: Pitot: ____ Orsat: ____ | Stack Diameter: _____ | K: _____ | Post-Test Leak Check: Pitot: _____ Orsat: ___

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature EF		Impinger Temp. °F	Aux. Temp.	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter			Inlet	Outlet	
		2233		3.7			108							
		2245		3.9			95							
		2304		3.7			107							
		2323		3.7			109							
		2342		3.7			105							
		0002		3.8			108							
		0020		3.9			103							
		0041		3.7			107							
		0058		3.7			112							
		0117		3.8			109							
		0137		4.0			109							
		0146		3.7			108							
		0248		3.9			105							
		0259		3.9			100							
		0309		3.8			103							
		0325		3.7			107							

ΔVm = _____ $\overline{\sqrt{\Delta p}}$ = _____ $\overline{\Delta H}$ = _____ $\overline{Ts}$ = _____ $\overline{Tm}$ = _____

EQM Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: AK Middletown Date: 9/13/16

Sampling Location: Baghouse Stack 1 Clock Time: _____

Run #: Flow Operators: EZ

Barometric Pressure, in. Hg: 30.15 Static Pressure, in.H_2O: -1.3

Moisture, %: _____ Molecular wt., Dry: _____ Pitot Tube, Cp: _____

Stack Dimension, in. Diameter or Side 1: _____ Side 2: _____

Wet Bulb, °F: _____ Dry Bulb, °F: _____ CO_2 % _____

Pitot # _____ Thermocouple # _____ O_2 % _____

Pitot Leak Check: Positive _____ Negative _____

[Push #]

Time	Traverse Point Number	Velocity Head in. H_2O	Stack Temp,°F
1035	1	~~3.5~~ 4.0	98
1049	2	4.1	115
1102	3	3.8	130
1116	4	3.8	136
1130	5	3.7	137
1141	6	3.8	135
1158	7	3.7	133
1217	8	3.6	130
1236	9	3.5	137
1254	10	3.5	136
1336	11	3.6	125
1429	12	3.6	130
1439	13	3.6	133
1456	14	3.6	128
1521	15	3.6	132
1532	16	3.7	133
1550	17	3.5	135
1605	18	3.5	132
1620	19	3.5	140
1641	20	3.5	138
1651	21	3.5	139
1700	22	3.6	138
1709	23	3.5	132
1721	24	3.5	135
1730	25	3.5	128
$\overline{\sqrt{\Delta P}}$ =		1.9053	$\overline{Ts}$ = 131

$Md=(0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%N_2)$

$Md=(0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md=$

$Ms=Md\times\left(1-\frac{\%H_2O}{100}\right)+18\times\left(\frac{\%H_2O}{100}\right)$

$Ms=(\quad)\times\left(1-\frac{\quad}{100}\right)+18\times\left(\frac{\quad}{100}\right)$

$Ms=$

$\overline{TS}=$ °F = °R(°F + 460)

$Ps = Pb + \frac{SP}{13.6} = (\quad) + \frac{\quad}{13.6}$

Ps = in. Hg

$\overline{\sqrt{\Delta P}}=$

$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

Vs = ft/s

$As =$ ft²

$Qs = Vs \times As \times 60$

$Qs = \quad \times \quad \times 60$

Qs = acfm

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1-\frac{\%H_2O}{100}\right)$

$Qs_{std} = \quad \times 17.647 \times \frac{\quad}{\quad} \times \left(1-\frac{\quad}{100}\right)$

Qs_{std} = dscfm

EQM Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: AK Middletown Date: 9/13/16

Sampling Location: Baghouse Stack 2 Clock Time: _____

Run #: Flow Operators: EC

Barometric Pressure, in. Hg: 30.15 Static Pressure, in.H_2O: -1.0

Moisture, %: _____ Molecular wt., Dry: _____ Pitot Tube, Cp: _____

Stack Dimension, in. Diameter or Side 1: _____ Side 2: _____

Wet Bulb, °F: _____ Dry Bulb, °F: _____ CO_2 % _____

Pitot # _____ Thermocouple # _____ O_2 % _____

[Push #] Pitot Leak Check: Positive _____ Negative _____

Time	Traverse Point Number	Velocity Head in. H_2O	Stack Temp,°F
1035	1	3.5	90
1048	2	3.5	112
1102	3	2.9	125
1116	4	3.0	132
1130	5	2.8	139
1141	6	2.8	135
1158	7	2.8	131
1217	8	2.9	132
1236	9	3.0	135
1254	10	2.8	136
	11		
	12		
	13		
	14		
	15		
	16		
	17		
	18		
	19		
	20		
	21		
	22		
	23		
	24		
	25		
$\overline{\sqrt{\Delta P}}$ =		1.7305	$\overline{Ts}$ = ~~100~~ 127

$Md=(0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%N_2)$

$Md=(0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md=$

$$Ms=Md\times\left(1-\frac{\%H_2O}{100}\right)+18\times\left(\frac{\%H_2O}{100}\right)$$

$$Ms=\left(\quad\right)\times\left(1-\frac{\quad}{100}\right)+18\times\left(\frac{\quad}{100}\right)$$

$Ms=$

$\overline{TS}$ = °F = °R(°F + 460)

$$Ps = Pb + \frac{SP}{13.6} = (\quad) + \frac{\quad}{13.6}$$

Ps = in. Hg

$\overline{\sqrt{\Delta P}}$ =

$$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$$

$$Vs = 85.49 \times \left(\quad\right) \times \left(\quad\right) \times \sqrt{\quad}$$

Vs = ft/s

As = ft^2

$Qs = Vs \times As \times 60$

Qs = × × 60

Qs = acfm

$$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1-\frac{\%H_2O}{100}\right)$$

$$Qs_{std} = \quad \times 17.647 \times \frac{\quad}{\quad} \times \left(1-\frac{\quad}{100}\right)$$

Qs_{std} = dscfm

EQM Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: AK Middletown Date: 9-14-16

Sampling Location: Baghouse Stack 1 Clock Time: _____

Run #: Flow Operators: MP

Barometric Pressure, in. Hg: ~~30.15~~ 30.21 Static Pressure, in.H_2O: -1.3

Moisture, %: _____ Molecular wt., Dry: _____ Pitot Tube, Cp: _____

Stack Dimension, in. Diameter or Side 1: _____ Side 2: _____

Wet Bulb, °F: _____ Dry Bulb, °F: _____ CO_2 % _____

Pitot # _____ Thermocouple # _____ O_2 % _____

Pitot Leak Check: Positive _____ Negative _____

Push #

TIME	Traverse Point Number	Velocity Head in. H_2O	Stack Temp,°F
1017	1	4.0	84
1028	2	3.9	91
1043	3	3.8	95
1104	4	3.9	96
1120	5	3.9	102
1137	6	4.0	104
1157	7	3.7	107
1216	8	3.7	120
1235	9	3.5	117
1254	10	3.6	119
1313	11	3.5	122
1325	12	3.8	95
1424	13	3.9	78
1434	14	3.9	110
1448	15	3.9	109
1604	16	3.8	106
1522	17	3.7	111
1547	18	3.8	113
1558	19	3.7	118
1613	20	3.8	120
1635	21	3.8	124
1649	22	3.7	121
1705	23	3.7	122
1722	24	3.7	124
1735	25	3.7	123
$\overline{\sqrt{\Delta P}}$ =		1.9429	$\overline{Ts}$ = 109

$Md=(0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%N_2)$

$Md=(0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md=$

$Ms=Md \times \left(1-\frac{\%H_2O}{100}\right) + 18 \times \left(\frac{\%H_2O}{100}\right)$

$Ms=(\quad) \times \left(1-\frac{\quad}{100}\right) + 18 \times \left(\frac{\quad}{100}\right)$

$Ms=$

$\overline{TS}=$ °F = °R(°F + 460)

$Ps = Pb + \frac{SP}{13.6} = (\quad) + \frac{\quad}{13.6}$

$Ps=$ in. Hg

$\overline{\sqrt{\Delta P}}=$

$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs=$ ft/s

$As=$ ft²

$Qs = Vs \times As \times 60$

$Qs = \quad \times \quad \times 60$

$Qs=$ acfm

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1-\frac{\%H_2O}{100}\right)$

$Qs_{std} = \quad \times 17.647 \times \frac{\quad}{\quad} \times \left(1-\frac{\quad}{100}\right)$

$Qs_{std} =$ dscfm

EQM Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: AK Middletown Date: 9/14/16

Sampling Location: P. Baghouse #2 Clock Time:

Run #: P-315-2 Operators: GD

Barometric Pressure, in. Hg: 30.21 Static Pressure, in.H_2O:

Moisture, %: Molecular wt., Dry: Pitot Tube, Cp: 0.84

Stack Dimension, in. Diameter or Side 1: 35.5" Side 2:

Wet Bulb, °F: Dry Bulb, °F: CO_2 %

Pitot # T4-16 Thermocouple # T4-16 O_2 %

Pitot Leak Check: Positive ✓ Negative ✓

CLOCK TIME	Traverse Point Number	Velocity Head in. H_2O	Stack Temp,°F
1018	1	3.2	95
1030	2	3.2	98
1044	3	3.3	104
1106	4	3.1	113
1122	5	3.3	116
1139	6	3.1	120
1159	1	3.0	125
1218	2	3.1	141
1239	3	3.0	139
1256	4	3.0	137
1315	5	3.2	139
1327	6	3.5	120
1426	1	3.3	108
1436	2	3.2	114
1451	3	3.1	120
1501	4	3.2	125
1521	5	2.8	130
1547	6	3.0	128
1558	1	2.8	126
1613	2	2.7	124
	3		
	4		
	5		
	6		
	1		
	2		
	3		
	4		
	$\overline{\sqrt{\Delta P}}$ =	1.7613	$\overline{Ts}$ = 121

$Md=(0.44\times\%CO_2)+(0.32\times\%O_2)+(0.28\times\%N_2)$

$Md=(0.44\times\quad)+(0.32\times\quad)+(0.28\times\quad)$

$Md=$

$Ms=Md\times\left(1-\frac{\%H_2O}{100}\right)+18\times\left(\frac{\%H_2O}{100}\right)$

$Ms=(\quad)\times\left(1-\frac{}{100}\right)+18\times\left(\frac{}{100}\right)$

$Ms=$

$\overline{TS}=\quad°F=\quad°R(°F+460)$

$Ps=Pb+\frac{SP}{13.6}=(\quad)+\frac{}{13.6}$

$Ps=\quad$ in. Hg

$\overline{\sqrt{\Delta P}}=$

$Vs=85.49\times Cp\times\overline{\sqrt{\Delta P}}\times\sqrt{\frac{Ts(°R)}{Ps\times Ms}}$

$Vs=85.49\times(\quad)\times(\quad)\times\sqrt{\quad}$

$Vs=\quad$ ft/s

$As=\quad$ ft²

$Qs=Vs\times As\times 60$

$Qs=\quad\times\quad\times 60$

$Qs=\quad$ acfm

$Qs_{std}=Qs\times 17.647\times\frac{Ps}{Ts}\times\left(1-\frac{\%H_2O}{100}\right)$

$Qs_{std}=\quad\times 17.647\times\frac{}{}\times\left(1-\frac{}{100}\right)$

$Qs_{std}=\quad$ dscfm

EQM Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: AK MIDDLETOWN Date: 9/14-15/16

Sampling Location: PUSHING BAGHOUSE (STACK 1) Clock Time: _____

Run #: _____ Operators: CJ

Barometric Pressure, in. Hg: 30.21 Static Pressure, in.H_2O: -1.3

Moisture, %: _____ Molecular wt., Dry: _____ Pitot Tube, Cp: _____

Stack Dimension, in. Diameter or Side 1: _____ Side 2: _____

Wet Bulb, °F: _____ Dry Bulb, °F: _____ CO_2 % _____

Pitot # _____ Thermocouple # _____ O_2 % _____

Pitot Leak Check: Positive _____ Negative _____

TIME	Traverse Point Number	Velocity Head in. H_2O	Stack Temp,°F
2222	1	4.0	84
2231	2	4.0	97
1246	3	3.9	101
2305	4	3.8	104
2323	5	3.8	102
2343	6	3.8	103
0001	7	3.9	103
0020	8	3.8	108
0040	9	3.8	106
0058	10	3.9	102
0118	11	3.9	98
0136	12	3.8	100
0145	13	4.0	86
0320	14	3.9	94
0336	15	3.8	99
0345	16	3.8	102
0355	17	3.9	99
0402	18	4.0	94
0410	19	3.8	94
0420	20	3.9	95
0435	21	4.0	92
0452	22	3.9	94
	23	4.0	89
	24	3.9	96
	25	4.0	92
$\overline{\sqrt{\Delta P}}$ =		1.977	$\overline{Ts}$=97

$Md=(0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%N_2)$

$Md=(0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md=$

$Ms=Md \times \left(1 - \frac{\%H_2O}{100}\right) + 18 \times \left(\frac{\%H_2O}{100}\right)$

$Ms=(\quad) \times \left(1 - \frac{\quad}{100}\right) + 18 \times \left(\frac{\quad}{100}\right)$

$Ms=$

$\overline{TS} = \quad °F = \quad °R(°F + 460)$

$Ps = Pb + \frac{SP}{13.6} = (\quad) + \frac{\quad}{13.6}$

$Ps = \quad$ in. Hg

$\overline{\sqrt{\Delta P}} =$

$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs = \quad$ ft/s

$As = \quad$ ft²

$Qs = Vs \times As \times 60$

$Qs = \quad \times \quad \times 60$

$Qs = \quad$ acfm

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1 - \frac{\%H_2O}{100}\right)$

$Qs_{std} = \quad \times 17.647 \times \frac{\quad}{\quad} \times \left(1 - \frac{\quad}{100}\right)$

$Qs_{std} = \quad$ dscfm

EQM Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: AK Middletown Date: 9-15-16

Sampling Location: ~~Combustion~~ Stack 1 Clock Time: _____

Run #: Pushing Operators: NP

Barometric Pressure, in. Hg: 30.24 Static Pressure, in.H_2O: -1.5

Moisture, %: _____ Molecular wt., Dry: _____ Pitot Tube, Cp: _____

Stack Dimension, in. Diameter or Side 1: _____ Side 2: _____

Wet Bulb, °F: _____ Dry Bulb, °F: _____ CO_2 % _____

Pitot # _____ Thermocouple # _____ O_2 % _____

Pitot Leak Check: Positive _____ Negative _____

Time	Traverse Point Number	Velocity Head in. H_2O	Stack Temp,°F
1034	1	4.0	85
1046	2	3.9	98
1059	3	3.9	101
1128	4	3.7	108
1138	5	3.8	110
1232	6	3.9	112
1241	7	3.9	115
1249	8	3.7	118
1258	9	3.8	120
1318	10	3.9	119
1332	11	3.9	115
1341	12	3.7	124
1436	X13	3.9	120
1448	X 14	3.9	118
1504	X 15	3.8	110
1521	X 16	3.7	120
1539	X 17	3.9	122
1550	X 18	3.6	117
1613	X 19	3.8	122
1631	X 20	3.8	121
1648	X 21	3.7	120
1705	X 22	3.7	121
1722	23	3.9	118
1735	24	3.8	121
	$\overline{\sqrt{\Delta P}}$ =	1.9535	$\overline{Ts}$ = 115

$Md=(0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%N_2)$

$Md=(0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md=$

$$Ms=Md\times\left(1-\frac{\%H_2O}{100}\right)+18\times\left(\frac{\%H_2O}{100}\right)$$

$$Ms=(\quad)\times\left(1-\frac{\quad}{100}\right)+18\times\left(\frac{\quad}{100}\right)$$

$Ms=$

$\overline{TS}$ = _____ °F = _____ $°R(°F+460)$

$$Ps = Pb+\frac{SP}{13.6}=(\quad)+\frac{\quad}{13.6}$$

Ps = _____ in. Hg

$\overline{\sqrt{\Delta P}}$ =

$$Vs = 85.49\times Cp\times\overline{\sqrt{\Delta P}}\times\sqrt{\frac{Ts(°R)}{Ps\times Ms}}$$

$$Vs = 85.49\times(\quad)\times(\quad)\times\sqrt{\quad}$$

Vs = _____ ft/s

As = _____ ft^2

$Qs = Vs \times As \times 60$

Qs = _____ × _____ × 60

Qs = _____ acfm

$$Qs_{std} = Qs\times 17.647\times\frac{Ps}{Ts}\times\left(1-\frac{\%H_2O}{100}\right)$$

$$Qs_{std} = \quad\times 17.647\times\frac{\quad}{\quad}\times\left(1-\frac{\quad}{100}\right)$$

Qs_{std} = _____ dscfm

EQM Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: AK Middletown Date: 9/15/16

Sampling Location: P. Baghouse # 2 Clock Time: _____

Run #: P-315-3 Operators: GD

Barometric Pressure, in. Hg: 30.24 Static Pressure, in.H_2O: _____

Moisture, %: _____ Molecular wt., Dry: _____ Pitot Tube, Cp: 0.84

Stack Dimension, in. Diameter or Side 1: 35.5" Side 2: _____

Wet Bulb, °F: _____ Dry Bulb, °F: _____ CO_2 % _____

Pitot # T4-16 Thermocouple # T4-16 O_2 % _____

Pitot Leak Check: Positive ✓ Negative ✓

Clock Time	Traverse Point Number	Velocity Head in. H_2O	Stack Temp,°F
1059	3	3.5	105
1130	4	3.3	114
1140	5	3.2	123
1235	6	3.1	118
1243	1	3.2	121
1251	2	3.2	120
1259	3	3.3	126
1309	4	3.2	127
1320	5	3.4	129
1334	6	3.2	132
1343	1	3.3	132
1438	2	3.2	124
1450	3	3.1	129
1506	4	3.3	136
1523	5	3.5	130
1540	6	3.2	127
1558	1	3.1	131
1615	2	3.3	126
1632	3	3.2	121
1650	4	3.1	117
1807	5	3.4	123
1724	6	3.2	121
1737	1	3.4	120
	2		
	3		
	4		
	5		
	6		
$\overline{\sqrt{\Delta P}}$ =		1.8043	$\overline{Ts}$ = 124

$Md=(0.44\times\%CO_2)+(0.32\times\%O_2)+(0.28\times\%N_2)$

$Md=(0.44\times\quad)+(0.32\times\quad)+(0.28\times\quad)$

$Md=$

$Ms=Md\times\left(1-\frac{\%H_2O}{100}\right)+18\times\left(\frac{\%H_2O}{100}\right)$

$Ms=(\quad)\times\left(1-\frac{\quad}{100}\right)+18\times\left(\frac{\quad}{100}\right)$

$Ms=$

$\overline{TS}=\quad°F=\quad°R(°F+460)$

$Ps=Pb+\frac{SP}{13.6}=(\quad)+\frac{\quad}{13.6}$

$Ps=\quad$ in. Hg

$\overline{\sqrt{\Delta P}}=$

$Vs=85.49\times Cp\times\overline{\sqrt{\Delta P}}\times\sqrt{\frac{Ts(°R)}{Ps\times Ms}}$

$Vs=85.49\times(\quad)\times(\quad)\times\sqrt{\quad}$

$Vs=\quad$ ft/s

$As=\quad$ ft²

$Qs=Vs\times As\times 60$

$Qs=\quad\times\quad\times 60$

$Qs=\quad$ acfm

$Qs_{std}=Qs\times 17.647\times\frac{Ps}{Ts}\times\left(1-\frac{\%H_2O}{100}\right)$

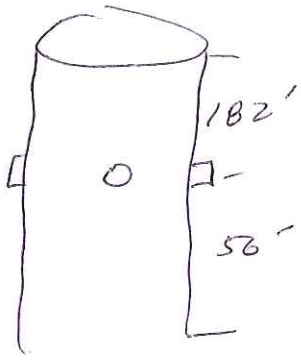
$Qs_{std}=\quad\times 17.647\times\frac{\quad}{\quad}\times\left(1-\frac{\quad}{100}\right)$

$Qs_{std}=\quad$ dscfm

EQM Environmental Quality Management, Inc.

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

Plant: AK Steel Middletown
Date: 8/22/16
Sampling Location: Combustion Stack
Inside of Far Wall to Outside of Nipple: _____
Inside of Near Wall to Outside of Nipple (Nipple Length): _____
Stack I.D.: 168
Distance Downstream from Flow Disturbance (Distance B):
2184 Inches/Stack I.D. = 13 dd
Distance Upstream from Flow Disturbance (Distance A):
672 Inches/Stack I.D. = 26 dd
Calculated By: Doug Allen



Schematic of Sampling Location

Traverse Point Number	Fraction of Length	Length (inches)	Product of Columns 2 & 3 (To nearest 1/8")	Nipple Length (inches)	Traverse Point Location (Sum of Col. 4 & 5)
1	2.1 %	168	3.5		
2	6.7%		11.3		
3	11.8 %		19.8		
4	17.7%		~~42.0~~ 29.7		
5	25.0%		~~59~~ 42.0		
6	35.6 %		59.8		